SONY

CCD UNIT

OHB-400/400P
OHB-450/450P
OHB-451/451P
OHB-500/500P
OHB-550/550P
OHB-405WS/405WSP
OHB-455WS/455WSP
OHB-500WS/500WSP
OHB-550WS/550WSP

Hyper HAD

Power HAD

MAINTENANCE MANUAL

1st Edition (Revised 7)

⚠警告

このマニュアルは，サービス専用です。
お客様が，このマニュアルに記載された設置や保守，点検，修理など行うと感電や火災，人身事故につながることがあります。
危険をさけるため，サービストレーニングを受けた技術者のみご使用ください。

⚠WARNING

This manual is intended for qualified service personnel only.
To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

⚠WARNUNG

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.
Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die Gefahr eines elektrischen Schlages, Feuergefahr und Verletzungen zu vermeiden, sind bei Wartungsarbeiten strikt die Angaben in der Anleitung zu befolgen. Andere als die angegeben Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

⚠AVERTISSEMENT

Ce manual est destiné uniquement aux personnes compétentes en charge de l’entretien. Afin de réduire les risques de décharge électrique, d’incendie ou de blessure n’effectuer que les réparations indiquées dans le mode d’emploi à moins d’être qualifié pour en effectuer d’autres. Pour toute réparation faire appel à une personne compétente uniquement.

OHB-400 (UC)	Serial No. 10001 and Higher
OHB-400 (J)	Serial No. 30001 and Higher
OHB-400P (CE)	Serial No. 40001 and Higher
OHB-450 (UC)	Serial No. 10001 and Higher
OHB-450 (J)	Serial No. 30001 and Higher
OHB-450P (CE)	Serial No. 40001 and Higher
OHB-451 (UC)	Serial No. 10001 and Higher
OHB-451 (J)	Serial No. 30001 and Higher
OHB-451P (CE)	Serial No. 40001 and Higher
OHB-500 (UC)	Serial No. 10001 and Higher
OHB-500 (J)	Serial No. 30001 and Higher
OHB-500P (CE)	Serial No. 40001 and Higher
OHB-550 (UC)	Serial No. 10001 and Higher
OHB-550 (J)	Serial No. 30001 and Higher
OHB-550P (CE)	Serial No. 40001 and Higher

OHB-405WS (UC)	Serial No. 10001 and Higher
OHB-405WS (J)	Serial No. 30001 and Higher
OHB-405WSP (CE)	Serial No. 40001 and Higher
OHB-455WS (UC)	Serial No. 10001 and Higher
OHB-455WS (J)	Serial No. 30001 and Higher
OHB-455WSP (CE)	Serial No. 40001 and Higher
OHB-500WS (UC)	Serial No. 10001 and Higher
OHB-500WS (J)	Serial No. 30001 and Higher
OHB-500WSP (CE)	Serial No. 40001 and Higher
OHB-550WS (UC)	Serial No. 10001 and Higher
OHB-550WS (J)	Serial No. 30001 and Higher
OHB-550WSP (CE)	Serial No. 40001 and Higher

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Manual Structure

Purpose of this manual

This manual is the maintenance manual for CCD unit which is installed in the color video camera BVP-500/500P/550/550P/570.
This manual describes the information items that premise the service based on the components parts such as alignment, schematic diagrams, board layouts and spare parts lists, assuming use of system and service engineers.

Contents

The following are summaries of the each section for understanding the manual.

Section 1. Service Overview
Describes information about notes on service and replacement of main parts.

Section 2. Electrical Alignment
Explains the general information for adjustment procedures and the electrical adjustments of this unit.

Section 3. Spare Parts
Describes parts list, exploded views and supplied accessories used in the unit.

Section 4. Semiconductor Pin Assignments
Describes function diagrams and pin names of semiconductor used in the unit.

Section 5. Block Diagram
Describes overall block diagram and block diagrams for every circuit board.

Section 6. Schematic Diagrams
Describes schematic diagrams for every circuit board and frame wiring .

Section 7. Board Layouts
Describes board layouts for every circuit board.

Relative manual

Besides this maintenance manual the following manual is available for this unit.

- **Installation Guide (Supplied with this unit)**
  This manual is necessary when the unit is supplied and installed.

Section 1
Service Overview

1-1. Notes on Service

1-1-1. Note on OHB Installation

When installing the OHB with the serial number as shown below in BVP-570 or BVP-500/550 which was upgraded by BKP-5090, be sure to perform adjustment described in the supplement separately available (Sony P/N: 9-968-544-01) in order to obtain optimum CCD's dynamic range.
For details, please consult your local Sony Sales Office/ Service Center.

Model	Serial No.
OHB-550 (UC)	10001 - 10490
OHB-550P (CE)	40001 - 40635
OHB-550WS (UC)	10001 - 10135
OHB-550WS (UC)	11001 - 11080
OHB-550WSP (CE)	40001 - 40380
OHB-550WSP (CE)	41001 - 41221
OHB-450 (UC)	10001 - 10645
OHB-450P (CE)	40001 - 40762
OHB-451 (UC)	10001 - 10165
OHB-451P (CE)	40001 - 40227
OHB-455WS (UC)	10001 - 10115
OHB-455WSP (CE)	40001 - 40265
OHB-500 (UC)	10001 - 10110
OHB-500P (CE)	40001 - 40133
OHB-500WS (UC)	10001 - 10058
OHB-500WS (UC)	11001 - 11010
OHB-500WSP (CE)	40001 - 40150
OHB-500WSP (CE)	41001 - 41050
OHB-400 (UC)	10001 - 10115
OHB-400P (CE)	40001 - 40048
OHB-405WS (UC)	10001 - 10070
OHB-405WSP (CE)	40001 - 40055
OHB-T450WS (UC)	10001 - 10090
OHB-T450WSP (CE)	40001 - 40040

1-1-2. Check of ROM Version

When the OHB-405WS/405WSP or OHB-455WS/ 455WSP is to be installed in the color video camera BVP-500/500P or BVP-550/550P, be sure to check that the ROM version for IC36/AT-95 board of the camera is ver. 2.01 or higher.
If replacement is required, contact your local Sony Sale Office/Service Center.
In the following cases, it is unnecessary to check.

- When the other OHB than the OHB-405/405WSP or OHB-455WS/455WSP is installed.
- When the OHB is installed in the camera which is provided with the AT-126 board.
  (such as the BVP-500/500P/550/550P upgraded by the BKP-5090, or the BVP-570)

ROM Version

IC36/AT-95 board Ver. 2.01 or higher

Note

ROM version can be checked easily on the viewfinder screen.
For details, refer to the BVP-550/550P maintenance manual, or the BVP-500/500P maintenance manual volume 1, Section 3 "Setup Menu".

1-1-3. Note in Replacing Parts on PR-212 Board

Every electrical component part mounted on the PR-212 board (supplied with the OHB-405WS/455WS/500WS/ 550WS or their PAL version) can not be replaced. If there is any defective part, replace the mounted circuit board itself.

1-1-4. Notes on Repair Parts

1. Standardization of Parts

Some repair parts supplied by Sony differ from those used for the unit. These are because of parts commonality and improvement.
Parts list has the present standardized repair parts.

2. Stock of Parts

Parts marked with “o” at SP(Supply Code) column of the spare parts list may not be stocked. Therefore, the delivery date will be delayed.

3. Units Representation

The following represented units are changed or omitted in writing.

Units		Representation
Capacitance	µF	uF
Inductance	µH	uH
Resistance	Ω	Abbreviation
Temperature	℃	XXX-DEG-C

4. Destination Representation

The part indicated “For J/UC/CE” in the spare parts list is used in the unit written below.

For J : The part is used in a unit for Japan.
For UC: The part is used in a unit for the U.S.A. and Canada.
For CE : The part is used in a unit for regions except the above countries.

1-1-5. 16:9/4:3 Selector Board

The PR-212 board and PR-243 board are 16:9/4:3 selector boards. The PR-212 board is supplied with the 16:9/4:3 switchable OHB *1 and the PR-243 board is separately available as a BKP-5091.
When installing the 16:9/4:3 switchable OHB *1 in your own camera, replace the termination board (CN-1142/1672) on the processing board (PR-211/242) with this 16:9/4:3 selector board (PR-212/243).
For details on installation, refer to the installation guide supplied with the OHB or the installation manual supplied with the BKP-5091. The relationships between the above-mentioned boards, camera and OHB are shown below.
The PR-211 or PR-242 board should be provided with any of the 16:9/4:3 selector board and the termination board. If not, normal video will not appear.

Note

Use only in the following combinations.

Camera	OHB type	Processing board	16:9 /4:3 select board	Termination board
BVP-550/550P	16:9/4:3 *1	PR-211	PR-212	—
BVP-550/550P	4:3 *2	PR-211	—	CN-1142
BVP-550/550P (12-bit DSP *3)	16:9/4:3 *1	PR-242	PR-243 *4	—
BVP-550/550P (12-bit DSP *3)	4:3 *2	PR-242	—	CN-1672
BVP-500/500P	16:9/4:3 *1	PR-211	PR-212	—
BVP-500/500P	4:3 *2	PR-211	—	CN-1142
BVP-500/500P (12-bit DSP *3)	16:9/4:3 *1	PR-242	PR-243 *4	—
BVP-500/500P (12-bit DSP *3)	4:3 *2	PR-242	—	CN-1672
BVP-570	16:9/4:3 *1	PR-242	PR-243 *4	—
BVP-570	4:3 *2	PR-242	—	CN-1672

∗1 : OHB-405WS/405WSP/455WS/455WSP/500WS/500WSP/550WS/550WSP
∗2 : OHB-400/400P/450/450P/451/451P/500/500P/550/550P
∗3 : Upgraded by the BKP-5090
∗4 : BKP-5091(separately available)

1-2. Removal of Shielding Case

Remove a shielding case or DR cover after removing the OHB from the camera.
As for how to remove the OHB, refer to the installation guide supplied with the OHB.

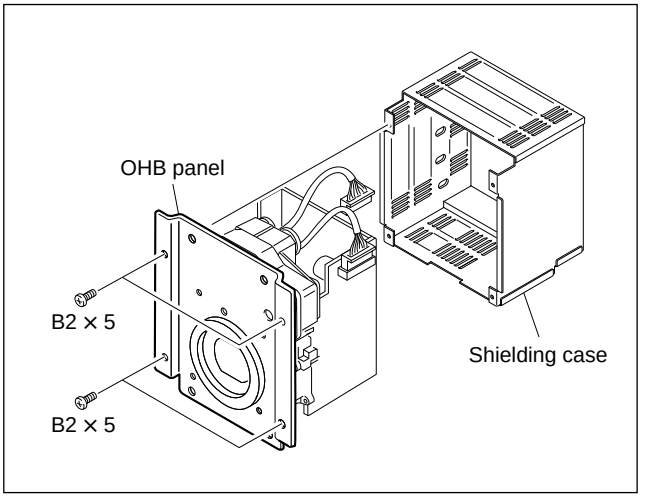
Note

When disconnecting the flexible card wires, refer to "1-3. Disconnecting/Connecting of Flexible Card Wire".

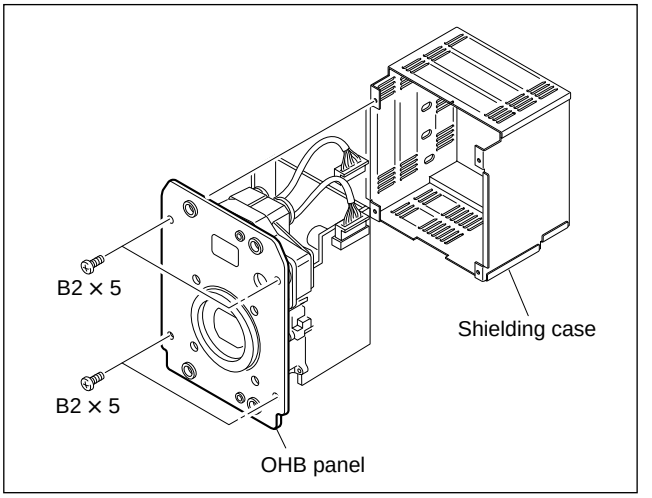
1-2-1. OHB for BVP-500/500P

1. Loosen the four screws and remove the shielding case.

OHB-400/400P

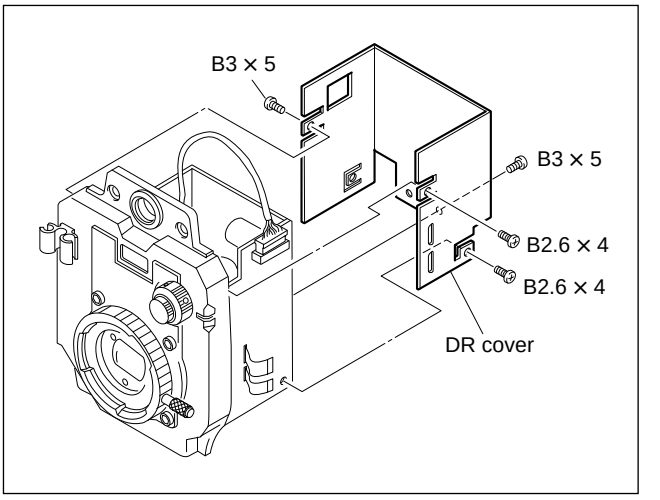


OHB-405WS/405WSP/500/500P/500WS/500WSP



1-2-2. OHB for BVP-550/550P

1. Loosen the four screws and remove the DR cover.

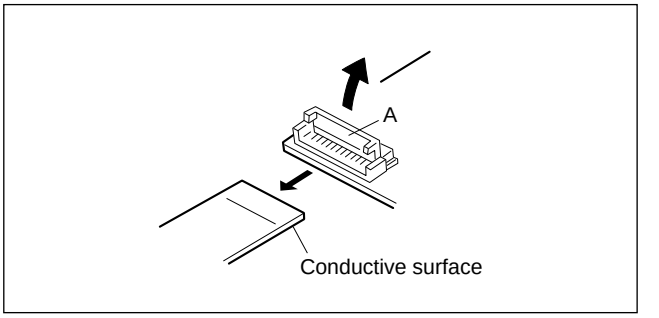


1-3. Disconnecting/Connecting of Flexible Card Wire

The two flexible card wires are used between the camera and DR-271 board, TG-159/195 board.
Be careful not to bend these wires. This shortens the wire life.

Disconnecting

1. Turn off the power of the camera.
2. Lift up the portion A in the direction of the arrow and disconnect the flexible card wire.



Connecting

Note

- Be careful not to insert the flexible card wire obliquely.
- Check that the conductive surface of the flexible card wire is not soiled with dust.

1. Lift up the portion A in the direction of the arrow. Insert the flexible card wire as far as it will go into connector with the conductive surface of the wire put down.
2. Push down the portion A to secure the flexible card wire.

1-4. Position Adjustment of Filter Knobs

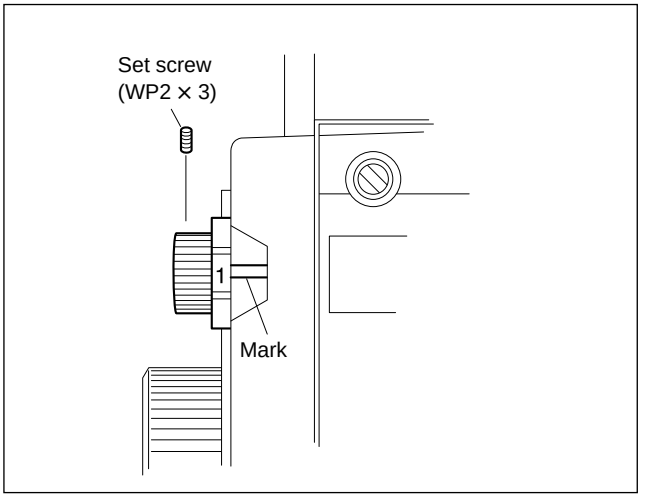
When installing the filter knobs, be sure to perform the following adjustment.

1-4-1. OHB-450/450P/451/451P

1. Rotate the knob shaft until the filter with the lightest color can be seen from the lens mount.

2. Align the filter knob number 1 with the mark on the front panel and tighten the setscrew.
   Tightening torque : 20×10^{-2} N•m (2.0 kgf•cm)

3. Rotate the filter knob and check that it moves smoothly.



1-4-2. OHB-455WS/455WSP/550/550P/ 550WS/550WSP

1. Rotate the outer knob shaft until the cross filter can be seen from the lens mount.

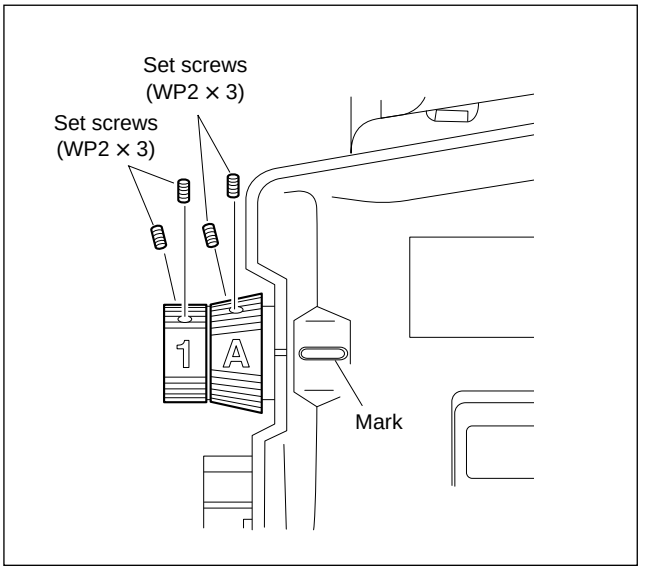
2. Align the CC filter knob number A with the mark on the front panel and tighten the two setscrews.
   Tightening torque : 20×10^{-2} N•m (2.0 kgf•cm)

3. Rotate the CC filter knob and check that it moves smoothly.

4. Rotate the inner knob shaft until the clear filter (straight through filter) can be seen from the lens mount.

5. Align the ND filter knob number 1 with the mark on the front panel and tighten the two setscrews.
   Tightening torque : 20×10^{-2} N•m (2.0 kgf•cm)

6. Rotate the ND filter knob and check that it moves smoothly.



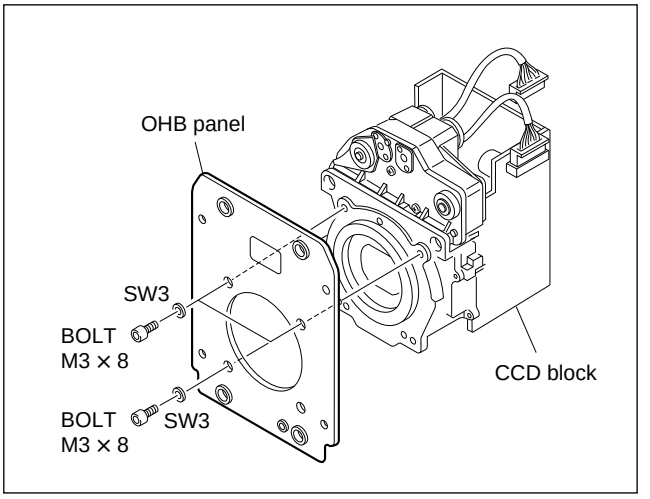
1-5. Replacement of Filter Disk Unit

1-5-1. OHB-405WS/405WSP/500/500P/ 500WS/500WSP

When replacing the filter disk unit, use the Servo Filter Unit BKDW-701(standard product) as a replacement part. The length of knob shaft of BKDW-701 is different from that of the filter disk unit which is used in the OHB before, but that exerts no influence on use.

1. Remove the shielding case. (Refer to “1-2. Removal of Shielding Case”.)

2. Remove the three screws to remove the OHB panel.

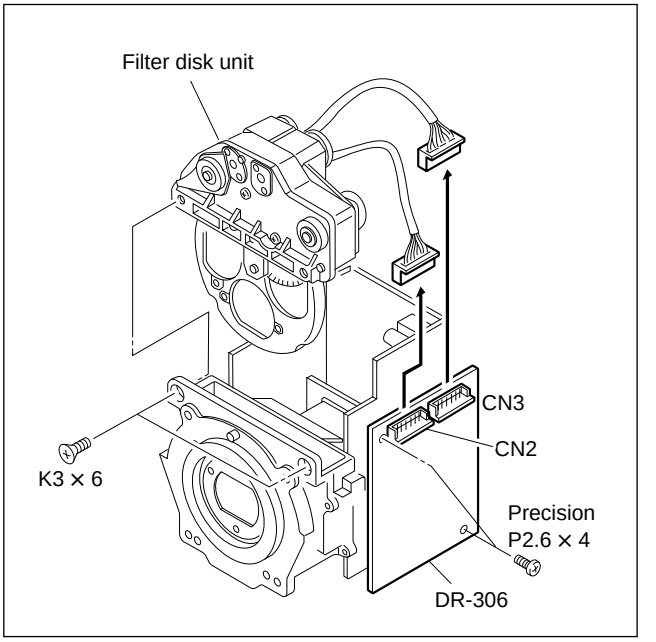


3. Disconnect the two connectors CN2 and CN3 on the DR-306 board.
   Remove the two screws and remove the DR-306 board from the CCD block.

Note

It is recommended to perform Steps 4 and 5 in a clean room.

4. Remove the two screws and then pull out the filter disk unit carefully.



5. Install the BKDW-701, taking care not to touch the filter surface. Secure it to the CCD block with the two screws that were removed in Step 4.

6. Attach the DR-306 board to the CCD block with the two screws supplied with BKDW-701.
   Connect the harness to CN2 and CN3 on the DR-306 board.

   Note

   Replace the filter disk unit and DR-306 board at the same time, because they were aligned in pairs at the factory.

7. Fit the CCD block to the OHB panel with the three screws.
   Tightening torque : 110×10^{-2} N•m (11 kgf•cm)

8. Attach the shielding case.

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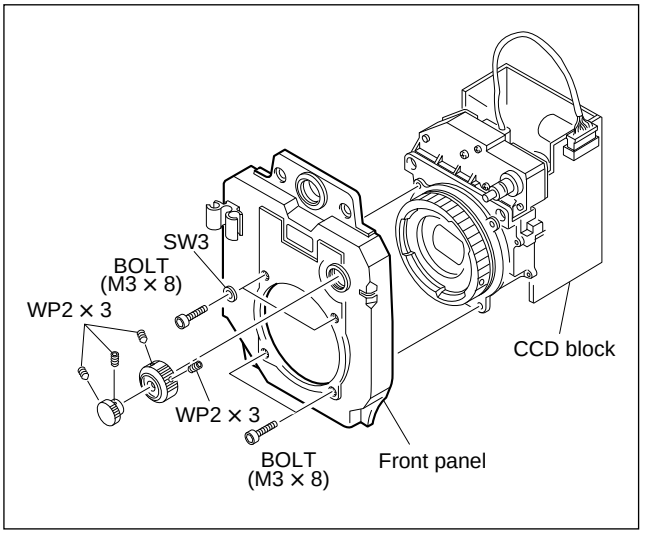
1-5-2. OHB-455WS/455WSP/550/550P/ 550WS/550WSP

1. Remove the two setscrews respectively to remove the ND and CC filter knobs.

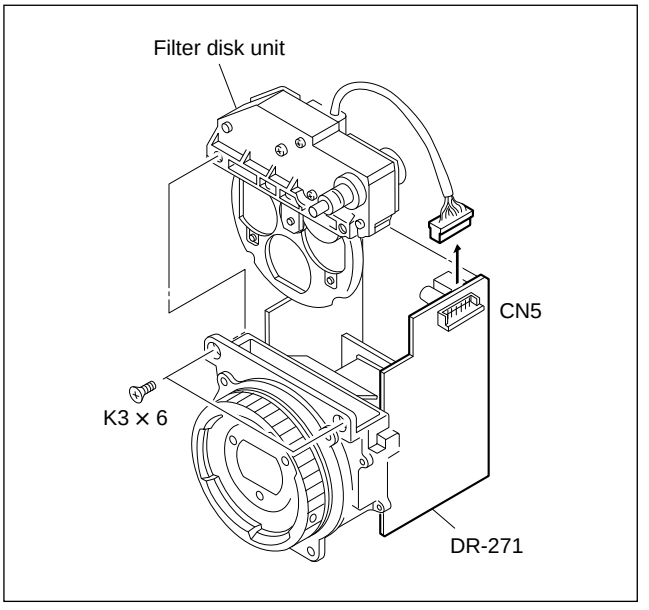
2. Remove the four bolts and remove the CCD block from the front panel.



Note

It is recommended to perform Steps 3 and 4 in a clean room.

3. Disconnect the connector CN5 on the DR-271 board. Remove the two screws and then pull out the filter disk unit carefully.



4. Install the new filter disk unit, taking care not to touch the filter surface. Secure it to the CCD block with the two screws that were removed in Step 3.

5. Connect the connector CN5 on the DR-271 board.

6. Fit the CCD block to the front panel with the four bolts.
   Tightening torque : 110×10^{-2} N•m (11 kgf•cm)

   Attach the CC/ND filter knobs and adjust them the referring to Section 1-4-2.

1-6. Function of Internal Switch

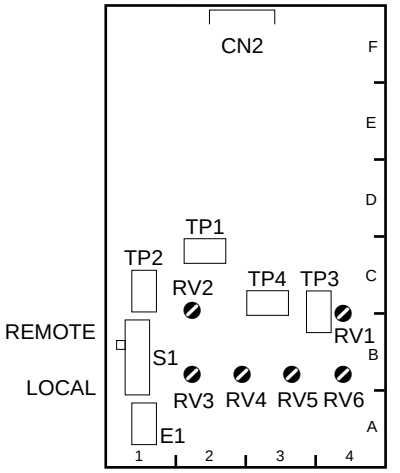
1-6-1. DR-302 board (OHB-400/400P/451/451P)

• S1 (REMOTE/LOCAL)

REMOTE : Filter selection is made by CCU, MSU and RCP.

LOCAL : (OHB-400/400P)
Filter selection is made by rotating the knob shaft in the front of the OHB with a flatblade screwdriver.
(OHB-451/451P)
Filter selection is made with the filter knob of the OHB.

Factory-setting : REMOTE



DR-302 Board (A SIDE)

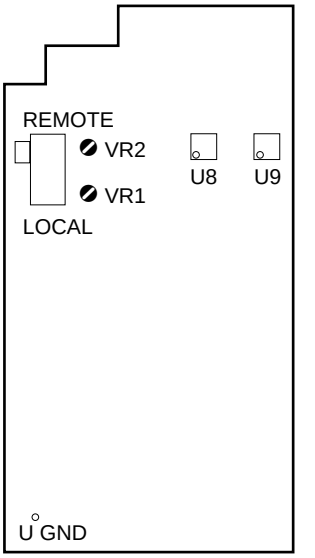
1-6-2. DR-306 board (OHB-405WS/405WSP/500/500P/500WS/500WSP)

• S1 (REMOTE/LOCAL)

REMOTE : Filter selection is made by CCU, MSU and RCP.

LOCAL : Filter selection is made by rotating the knob shaft in the front of the OHB with a flatblade screwdriver.

Factory-setting : REMOTE



DR-306 Board (A SIDE)

1-7. OHB Fixing Tool

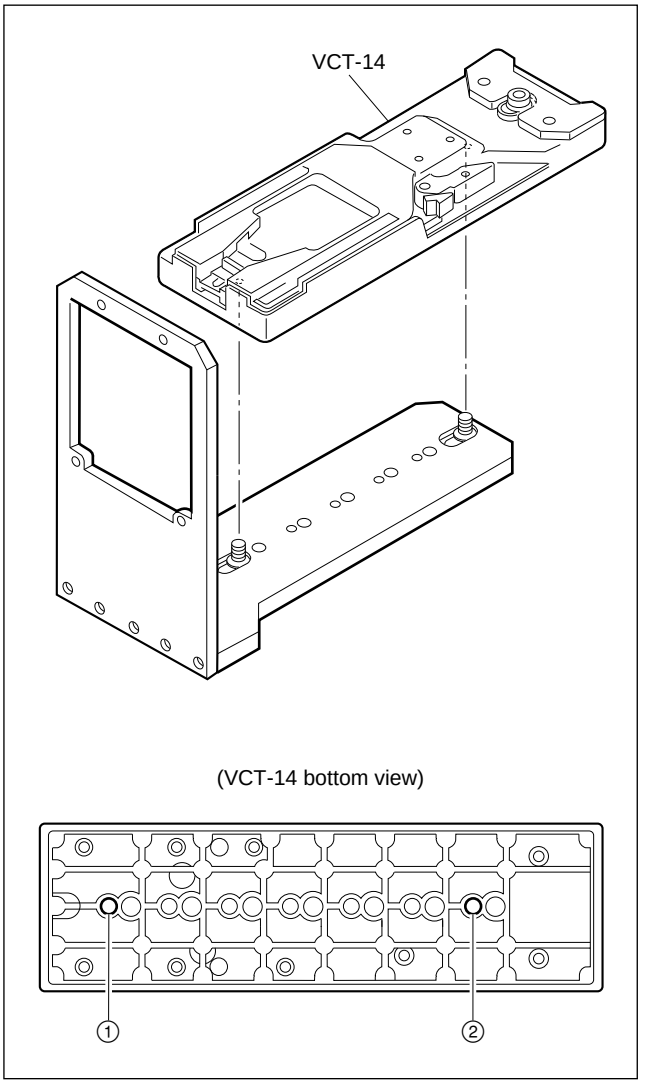
OHB fixing tool (Sony P/N J-6395-100-A) is separately available to adjust the PA board of the OHB for a portable camera.

How to Use

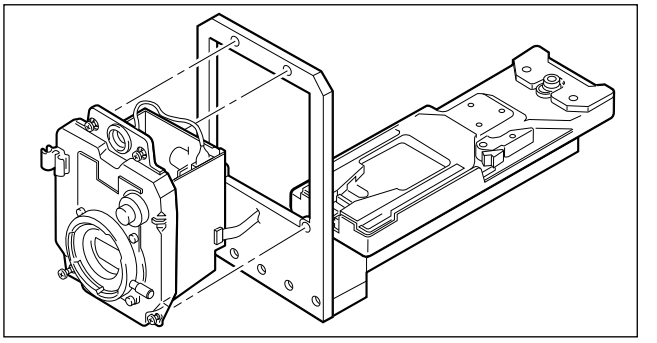
1. Install a tripod adaptor VCT-14 on the OHB fixing tool with the two screws, using the supplied allen wrench (width across flats: 3/16).

   Note

   Tighten in order of ① to ② .



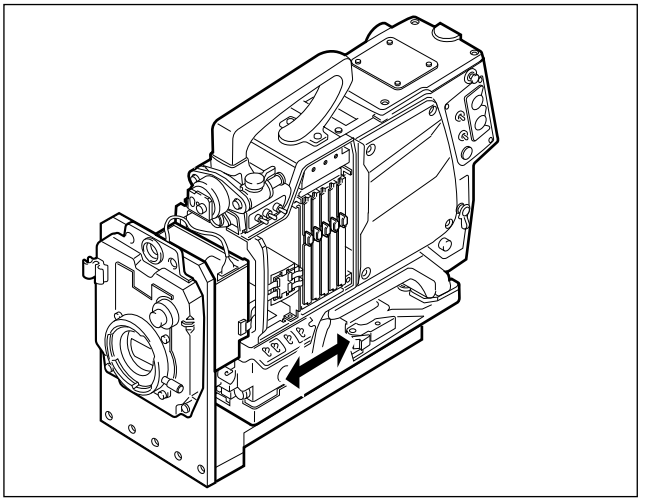
2. Remove the right side panel of the camera. Loosen the four screws and pull out the OHB from the camera. Disconnect the three cables from the OHB.
3. Remove the DR cover. (Refer to Section 1-2.)
4. Secure the OHB to the OHB fixing tool with the four screws.



5. Attach the camera to the tripod adaptor.
6. Connect the cables to the OHB referring to the operation manual.

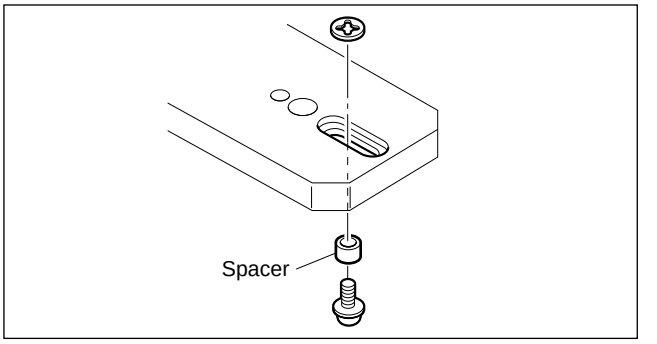
   Note

   The tripod adaptor can slide to and fro. Align to a proper position when connecting between the OHB and camera, or adjusting the PA board.



Notes

- The OHB fixing tool with the camera installed can be mounted on a tripod with an 1/4 -inch or 3/8-inch screw.
- If removing the spacer shown in the figure, you can fix the tripod adaptor to the OHB fixing tool. In this case, the tripod adaptor can not slide.



1-8. Recommended Replacement Part

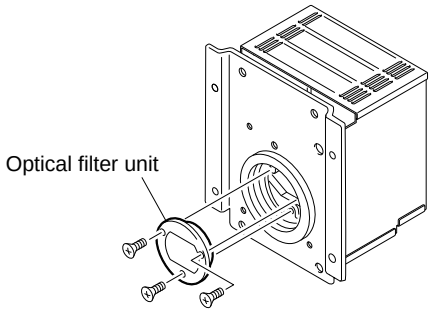
Optical filter unit used in the unit is a recommended replacement part. It may be turned cloudy with the lapse of time.
If using a cloudy filter, the performance of camera will not be delivered. Replace it according to necessary.

Note

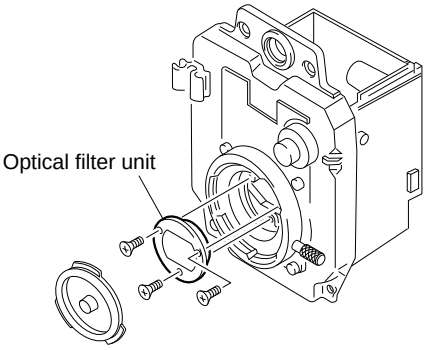
It is recommended to replace the optical filter unit in a clean room.

Description	Sony Part No.	Model
FILTER UNIT, OPTICAL	1-467-820-11	OHB-405WSP/455WSP/500WSP/550WSP (CE)
FILTER UNIT, OPTICAL	1-467-820-21	OHB-405WS/455WS/500WS/550WS (UCJ)
FILTER UNIT, OPTICAL	1-547-579-11	OHB-500P/550P (CE)
FILTER UNIT, OPTICAL	1-547-579-21	OHB-500/550 (UCJ)
FILTER UNIT, OPTICAL	1-547-845-11	OHB-400P/450P/451P (CE)
FILTER UNIT, OPTICAL	1-547-845-21	OHB-400/450/451 (UCJ)

OHB-400/400P/500/500P
OHB-405WS/405WSP/500WS/500WSP



OHB-450/450P/451/451P/550/550P
OHB-455WS/455WSP/550WS/550WSP



1-9. Description on CCD Block Number

Every CCD unit has its own ID number called CCD block number. It shows the CCD block type and serial number for the CCD block.
The CCD block number label is put in the CCD unit.

Ex.)

FWA×××××
- FWA: CCD block type
- ××××× : Serial number for CCD block

1-10. Replacing the CCD Unit

1-10-1. BVP-500/500P

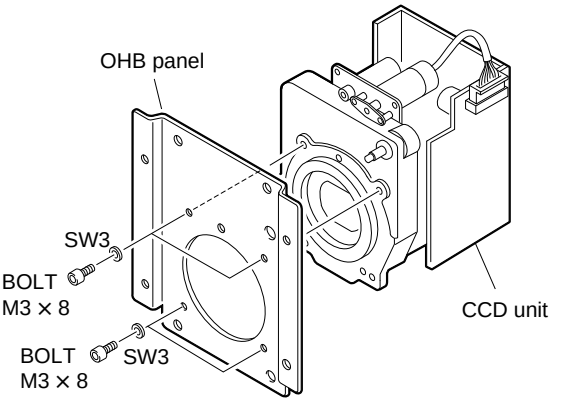
When replacing the CCD unit, order the applicable unit through a sales channel as shown below.

Model	Replacement CCD unit	CCD block type*1
OHB-400(UC)	BKP-C400(UC)	FWA
OHB-400P(CE)	BKP-C400P(CE)	FXA
OHB-500(UC)	BKP-C500(UC)	FYA
OHB-500P(CE)	BKP-C500P(CE)	FZA
OHB-405WS(UC)	BKP-C405W(UC)	GZA
OHB-405WSP(CE)	BKP-C405WP(CE)	HAA
OHB-500WS(UC)	BKP-C500W(UC)	GAA, HXA
OHB-500WSP(CE)	BKP-C500WP(CE)	GBA, HYA

*1: For detail on CCD block type, refer to Section 1-9.

1. Perform Section 1-2 “Removing the Shielding Case” to remove the shielding case.
2. OHB-405WS/405WSP/500/500P/500WS/500WSP:
   Perform step 2 in Section 1-5-1 “OHB-405WS/500/500WS” to remove the OHB panel.
   OHB-400/400P:
   Remove the four screws to remove the OHB panel.

OHB-400/400P



3. Remove the two screws securing carrying holder to a replacement CCD unit.

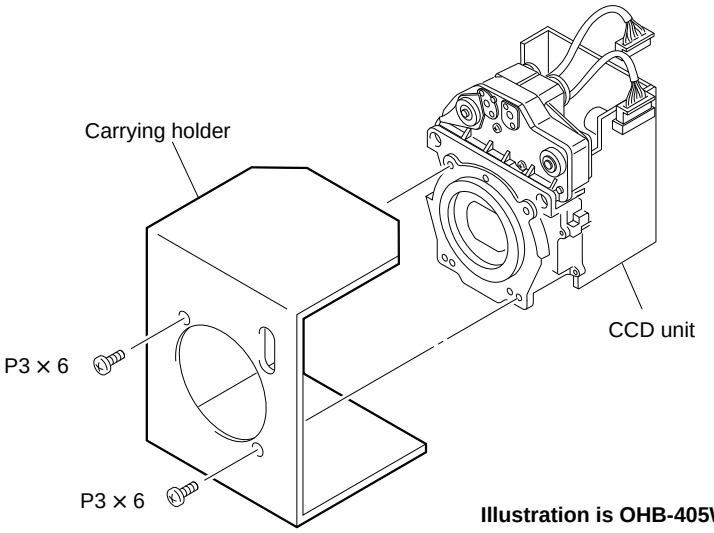


Illustration is OHB-405WS/500/500WS series.

4. Attach the shielding case and OHB panel that were removed in steps 1and 2 to the replacement CCD unit. Then, install it in the reverse order of removal.
5. Reinstall the new CCD unit in the camera. As for how to install the OHB, refer to installation guide supplied with the OHB.

Note

The replacement CCD unit come with the flexible card wire and harness. Disconnect those from the original OHB and reuse them when reinstalling.

6. After the replacement is complete, perform adjustment referring to Section 4 “Electrical Alignment for OHB Installation” in BVP-500/500P maintenance manual.

Note

The carrying holder can be reused when you want to transport the CCD unit that needs to be repaired.

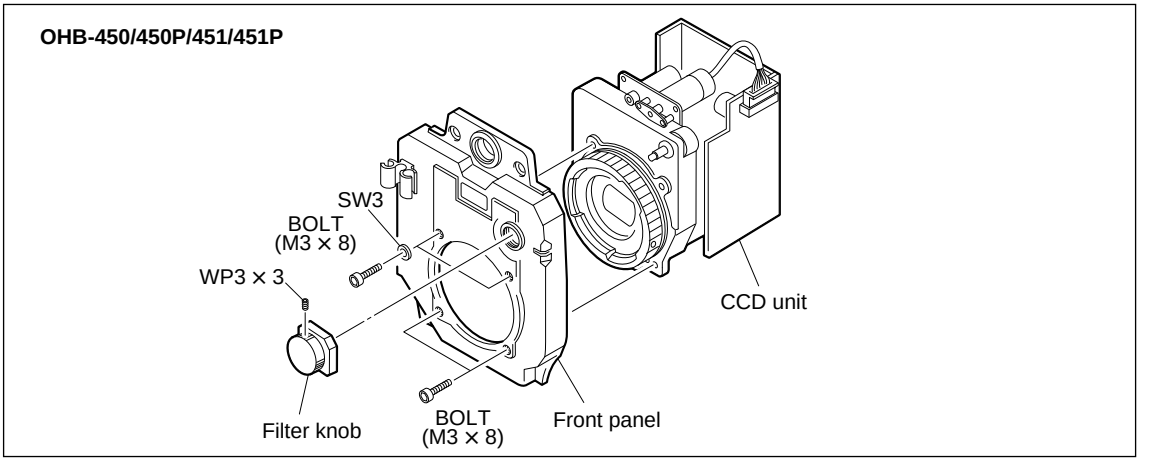
1-10-2. BVP-550/570

When replacing the CCD unit, order the applicable unit through a sales channel as shown below.

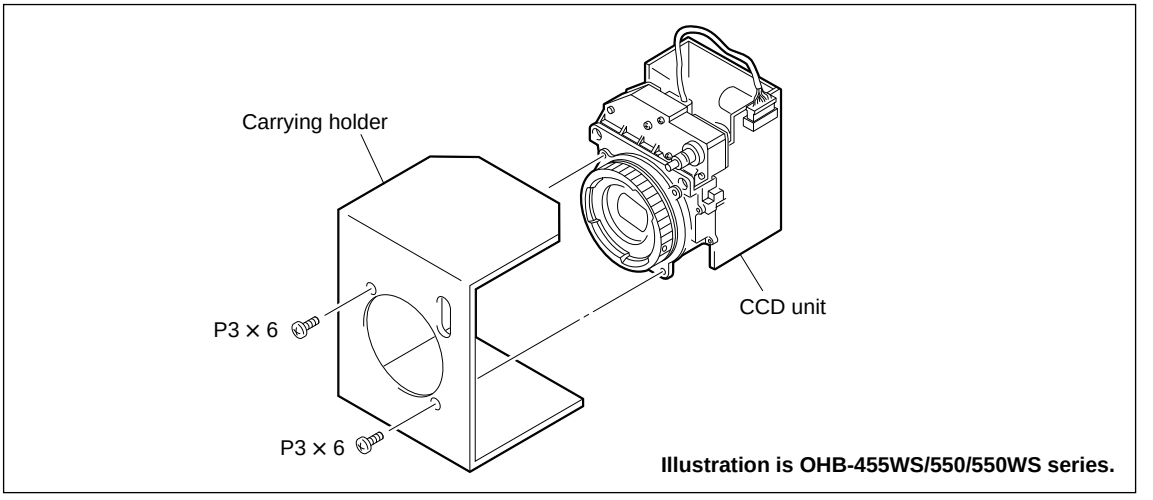
Model	Replacement CCD unit	CCD block type*1
OHB-450(UC)	BKP-C450(UC)	GCA
OHB-450P(CE)	BKP-C450P(CE)	GDA
OHB-451(UC)	BKP-C451(UC)	GEA
OHB-451P(CE)	BKP-C451P(CE)	GFA
OHB-550(UC)	BKP-C550(UC)	GGA
OHB-550P(CE)	BKP-C550P(CE)	GHA
OHB-455WS(UC)	BKP-C455W(UC)	HBA
OHB-455WSP(CE)	BKP-C455WP(CE)	HCA
OHB-550WS(UC)	BKP-C550W(UC)	GIA, HVA
OHB-550WSP(CE)	BKP-C550WP(CE)	GJA, HWA

*1: For detail on CCD block type, refer to Section 1-9.

1. Perform Section 1-2 “Removing the Shielding Case” to remove the DR cover.
2. OHB-455WS/455WSP/550/550P/550WS/550WSP:
   Perform steps 1 and 2 in Section 1-5-2 “OHB-455WS/455WSP/550/550P/550WS/550WSP” to remove the front panel.
   OHB-450/450P/451/451P:
   Remove the setscrew securing the filter knob. Remove the four bolts securing the front panel.



3. Remove the two screws securing the carrying holder to a replacement CCD unit.



4. Attach the shielding case and the front panel that were removed in steps 1and 2 to the replacement CCD unit. Then, install it in the reverse order of removal.
5. Reinstall the new CCD unit in the camera. As for how to install the OHB, refer to installation guide supplied with the OHB.

Note

The replacement CCD unit come with the flexible card wire and harness. Disconnect those from the original OHB and reuse them when reinstalling.

6. After the replacement is complete, perform adjustment referring to the BVP-550/570 maintenance manual.
   BVP-550: Refer to Section 4-2 “Electrical Alignment for OHB Installation”.
   BVP-570: Refer to Section 4 “Electrical Alignment for OHB Installation”.

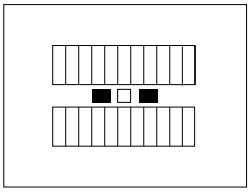
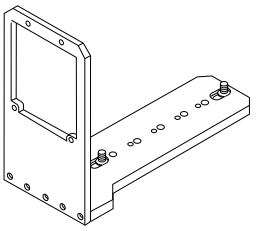
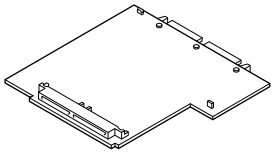
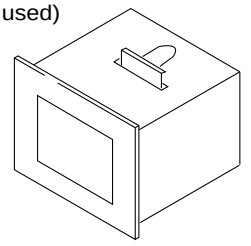
Notes

- When reinstalling the CC/ND filter knobs, be sure to adjust them referring to Section 1-4.
- The carrying holder can be reused when you want to transport the CCD unit that needs to be repaired.

Section 2
Electrical Alignment

2-1. Preparation

2-1-1. Equipment Required

Gray Scale Chart	OHB Fixing Tool
Transparent chart Sony Part No : J-6026-130-B Reflective chart (refer to section 2-1-4.) 	Sony Part No : J-6395-100-A To extend the OHB for portable cameras 
Extension board EX-464	Pattern Box PTB-500
Sony Part No : A-8318-864-A 	Sony Part No : J-6029-140-B Power supply AC90-240V (when the transparent chart is used) 

Measuring Equipment

- Oscilloscope
  Tektronix 2465B or equivalent
- Waveform monitor
  Tektronix 1780 or equivalent(For NTSC)
  Tektronix 1781 or equivalent(For PAL)
- Digital voltmeter Advantest TR6845 or equivalent
- Color monitor
  Sony BVM-1911/2811 or equivalent(For NTSC)
  Sony BVM-2011P/3011P or equivalent(For PAL)

Peripheral Equipment

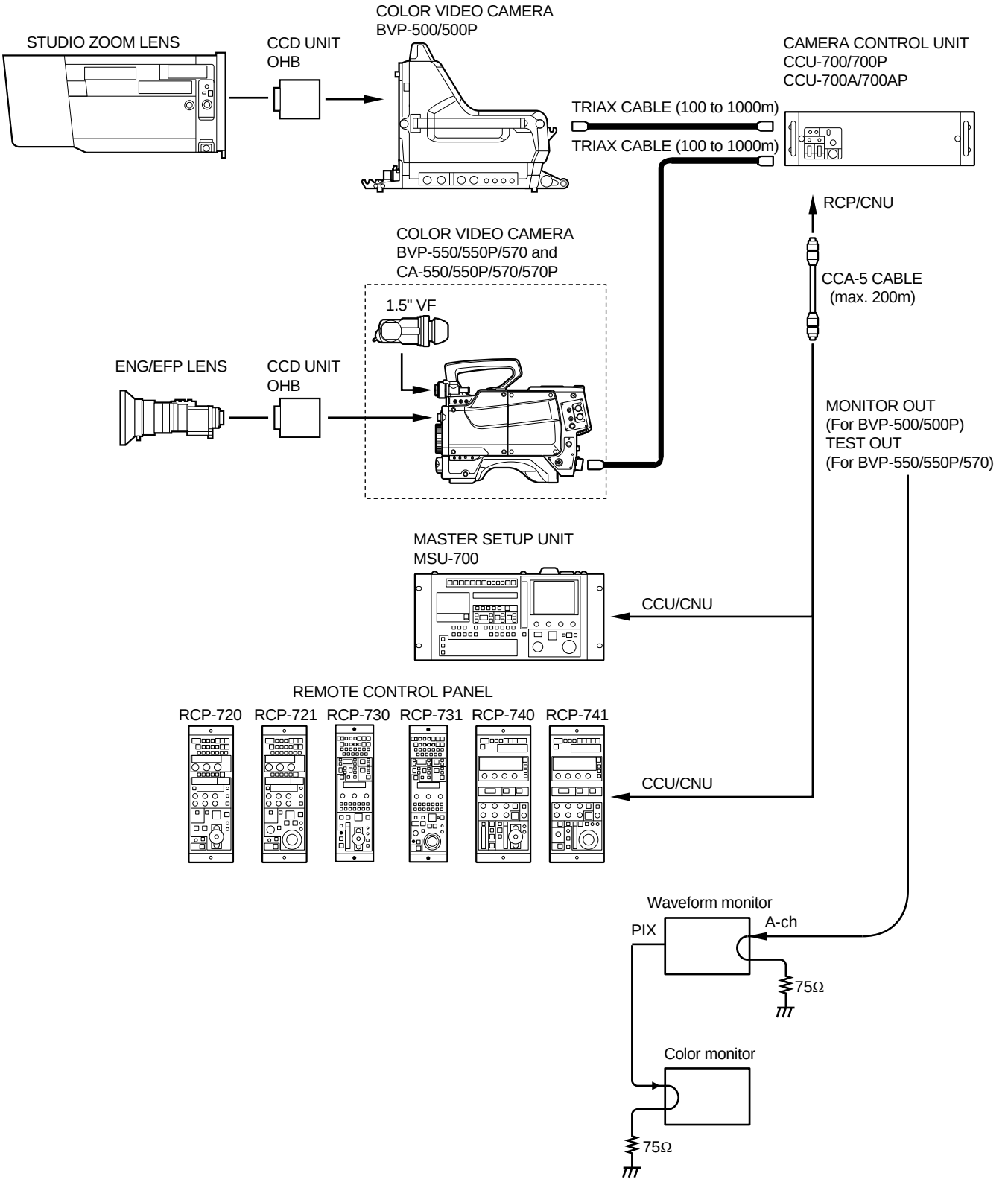
- Video Camera : BVP-500/500P or BVP-550/550P/570*1
- Camera Control Unit : CCU-700/700P/700A/700AP
- Master Setup Unit : MSU-700
- Remote Control Panel : RCP-720/721/730/731/740/741
- TRIAX Cable

*1 : The OHB with the specified serial number, requires additional adjustments described in separately available manual.
For details, see to Section "1-1-1. Note on OHB Installation".

2-1-2. Notes on Adjustment

- In this section, model names are abbreviated as follows.
  OHB-400/400P/405WS/405WSP
  OHB-500/500P/500WS/500WSP
  → OHB for studio cameras
  OHB-450/450P/451/451P/455WS/455WSP
  OHB-550/550P/550WS/550WSP
  → OHB for portable cameras
  OHB both for studio cameras and for portable cameras
  → OHB
  CCU-700/700P/700A/700AP → CCU
  MSU-700 → MSU
  RCP-720/721/730/731/740/741 → RCP
- Make sure that the adjustment of the video camera and CCU are completed.
- As for how to operate the menu, refer to the maintenance manual supplied with the camera.
- Perform adjustment in the state in which the OHB installed into the BVP.
  When adjusting the PA board of the OHB for portable cameras, however, extend the OHB from the BVP with the OHB Fixing Tool. (Refer to Section 1-7.)
- PA board differs depending on the type of OHB. (PA-181 or PA-213 board) But, adjustment for them can be performed in the same manner.
- Never change the setting of the following variable capacitors and resistors. These are extremely difficult to adjust in the field.
  PA-181/213 board : ⊘CV1, ⊘CV2, ⊘CV3, ⊘RV1, ⊘RV2, ⊘RV3

2-1-3. Connection



http://getMANUAL.com

2-1-4. Maintaining the Grayscale Chart

For the PA gain adjustment, using an 89.9 %-reflective grayscale chart is preferable.
If a reflective chart is not available, use a well-maintained pattern box and a transparent grayscale chart for adjustment.
Before beginning adjustment, set the illumination of the light source (or the luminous intensity on the chart surface) properly proceeding as follows and set the color temperature to 3200 K exactly by adjusting light.

Information on the reflective grayscale chart

Recommended chart

The reflective grayscale chart is commercially available.

Recommended chart: Reflective grayscale chart (with a special case)
MURAKAMI COLOR RESEARCH LABORATORY GS-3
or equivalent

Supplier: MURAKAMI COLOR RESEARCH LABORATORY
Address: 3-11-3, Kachidoki, Chuo-ku, Tokyo, JAPAN
Postcode 104-0054
Phone: 81-3-3532-3011
Fax: 81-3-3532-2056

Handling precautions

- Do not touch the chart's surface.
- Do not subject the surface to dirt, scratches or prolonged exposure to sunlight.
- Protect the chart from excess moisture and harmful gas.
- Avoid resting articles against the case.
- Open the case and dry the chart more an hour for a month in no use long period.

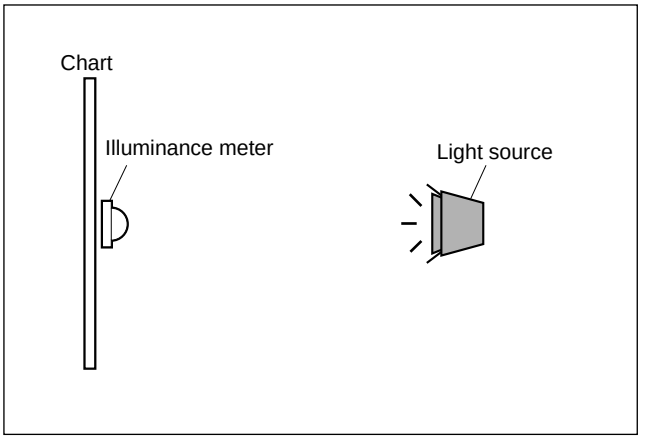
Replacement period when the chart is used as the reference

The reflective grayscale chart should be replaced every two years if it used as the reference. Because the chart deteriorates with time and proper adjustment cannot be achieved.
Replacement period varies according to storage conditions of the chart.

Setting illumination (when the reflective chart is used)

Equipment: Illuminance meter (Calibrated)

1. Turn on the light source and warm up for about 30 minutes.
2. Place the illuminance meter on the chart surface. Adjust the position and angle of the light source so that the whole surface of the chart is evenly 2000 lx.
   Note
   Light the chart from almost the same direction and height as the camera to shoot the chart.



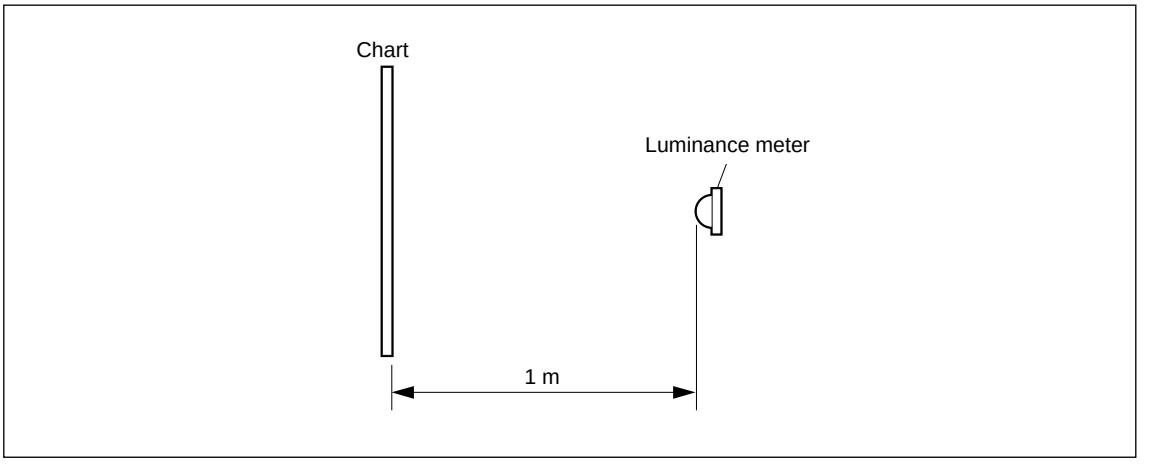
Setting luminous intensity (when the transparent chart is used)

Equipment: Luminance meter (Minolta LS-110 or equivalent. Calibrated.)

1. Light the pattern box and warm up for about 30 minutes.
2. Place the pattern box where the chart is not exposed to light, such as a darkroom.
   (Or cover the pattern box with a cover whose inside is painted in black.)
3. Place the luminance meter facing straight to the chart at a distance of 1 m from it.
4. Adjust the luminance control of the pattern box so that the white portion in the center of the chart is 573 ± 6 cd/m^2.

   Note

   This corresponds to the luminous intensity on the 89.9 %-reflective chart at 2000 lx.



2-2. PA Gain Adjustment (For BVP-500/500P)

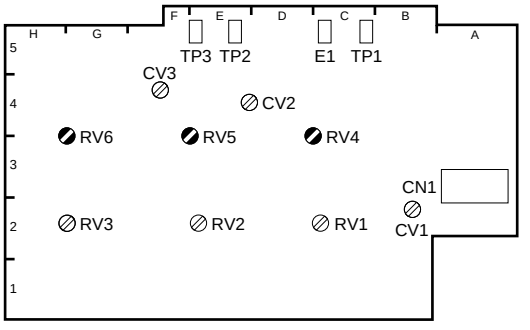
Equipment : Waveform monitor

Preparations:

- Set the filter of OHB using MSU (or RCP).
  OHB-405WS/405WSP/500/500P/500WS/500WSP : 1B
  OHB-400/400P : A
- Extend the VA-163/163A board of BVP-500/500P with EX-464 extension board.
- Connect a waveform monitor to the MONITOR OUT connector.
- Reset the adjustment data as follows.
  1. Open the AUTO SETUP page of the OPERATION menu and execute LEVEL AUTO. Or push AUTO SETUP LEVEL button on MSU/RCP and execute LEVEL AUTO.
  2. Select TEST 2 to output the 3-step test signal.
  3. Execute AUTO WHITE to automatically adjust the white belance.
  4. Turn off the test signal.
- Open BLACK SHADING page of the MAINTENANCE menu and set MASTER GAIN to 0 dB, or set MASTER GAIN to 0 dB using MSU/RCP.

Adjustment points:

⊘RV6 [H3] (R GAIN)/PA-181/213
⊘RV5 [F3] (G GAIN)/PA-181/213
⊘RV4 [C3] (B GAIN)/PA-181/213
Object: Gray-scale chart



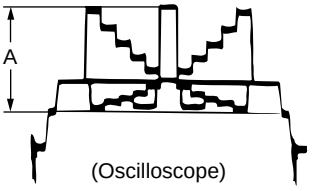
PA-181/213 Board (B SIDE)

Adjustment Procedures:

1. Set the MONITOR OUT select switch on the IF-538 board (BVP-500/5000P) to VF.
   Set the RGB switch on the rear panel to G.
2. Open BLACK SHADING page of the MAINTENANCE menu and execute AUTO BLACK, or press BLACK button for AUTO SETUP on MSU/RCP to automatically adjust the black balance.
3. Open BLACK SHADING page of the MAINTENANCE menu and set BLACK [M] to 3 IRE for NTSC or 35 mV for PAL , or set MASTER BLACK to 3 IRE for NTSC or 35 mV for PAL using MSU/RCP.
4. Open the KNEE/W CLIP page of the PAINT menu and set KNEE to OFF, or Set the KNEE OFF button on MSU to OFF (lights up).
5. Connect the oscilloscope to pin72 (GND: pin71, Trig: pin8)/ extension board (extending VA-163/163A).
6. Turn ⊘RV5 [F3] (G GAIN) / PA-181/213 fully clockwise.
7. Shoot the gray-scale chart so that the chart frame is aligned with the underscanned monitor frame.

Test point : pin72/extension board (extending VA-163/163A)
Adjustment point : Adjust the iris control of the lens.
Specifications :

Model	Specification
OHB-405WS OHB-405WSP	A = 190 mV
OHB-500 OHB-500P OHB-500WS OHB-500WSP OHB-400 OHB-400P	A = 230 mV

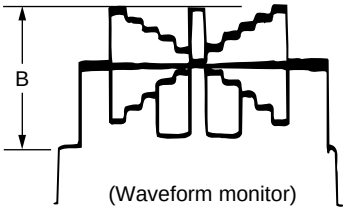


(Oscilloscope)

Note

Do not change the lens iris until the PA board adjustment is finished.

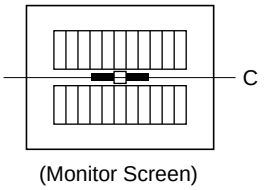
Test point : MONITOR OUT connector/BVP
Adjustment point : ⊘RV5 [F3] (G GAIN)/PA-181/213
Specifications : B = 92.5 ±2.0 IRE (for NTSC)
B = 700 ±14 mV (for PAL)



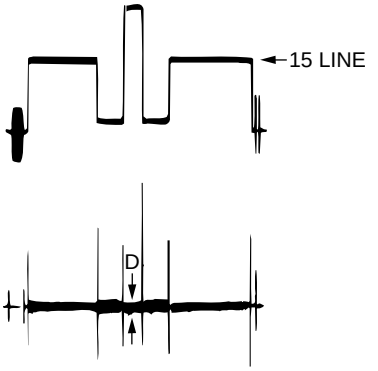
(Waveform monitor)

10. Set the MONITOR OUT select switch on the IF-538 board(BVP-500/500P) to VBS.
11. Open the GAMMA page of the PAINT menu and set the GAMMA to OFF, or set the GAMMA OFF button on MSU to OFF (lights up).
12. Put the waveform monitor into 15 lines mode and observe portion C on the monitor.
13. Put the waveform monitor into the CHROMA mode.

Test point : MONITOR OUT connector/BVP
Adjustment points : ⊘RV6 [H3] (R GAIN)/PA-181/213
⊘RV4 [C3] (B GAIN)/PA-181/213
Specifications : Minimize the carrier leakage D.



(Monitor Screen)



D=MINIMUM
(Waveform monitor)

14. After the adjustment, set the menu as follows.
GAMMA → ON
KNEE → ON

2-3. DR-302 board Adjustment (For OHB-400/400P)

Notes:

- When the filter servo board DR-302 is replaced or the filter disk improperly operates, the following adjustment is required.

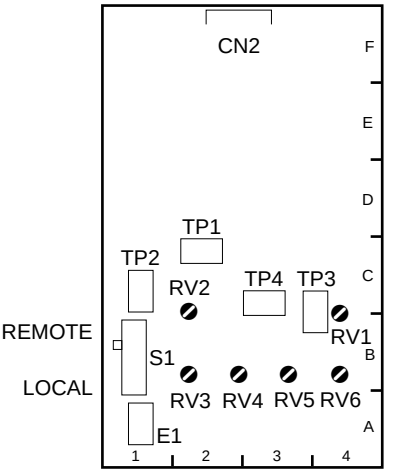
- When the clearest filter (3200 K) can be seen from the lens mount, the click position of the knob shaft is assumed to be filter number A.
Rotating the knob shaft with a flatblade screwdriver to clockwise, the filter changes from A to D in order.

Filter No.	Filter(standard)
A	3200 K
B	5600 K + 1/4 ND
C	5600 K
D	5600 K + 1/16 ND

Equipment: Digital voltmeter

Preparations:

1. Install the OHB-400/400P without the shielding case into the BVP-500/500P.
2. Open the right side panel of BVP-500/500P.
Set S1 on DR-302 board to LOCAL.
3. Turn on the power of the BVP-500/500P.



DR-302 Board (A SIDE)

2-3-1. Filter Follower Voltage Adjustment

Adjustment Procedures:

1. Adjust the controls so that the specifications are satisfied when the filter No.A or No.D can be seen from the lens mount rotating the knob shaft with a flatblade screwdriver.

Test point : TP2 [C1] (GND: E1 [A1])/DR-302

Filter No.	Adj. point	Spec.
A	⊘RV2 [C2] /DR-302	4.45 ±0.10 V
D	⊘RV1 [C4] /DR-302	0.55 ±0.10 V

Note

Perform this adjustment several times until the specifications are satisfied, because the adjustments of ⊘RV2 and ⊘RV1 influence each other.

2-3-2. Filter Servo Adjustment

Adjustment Procedures:

1. Set S1 on DR-302 board to REMOTE.
   Select the filter select button “A” of MSU (or RCP).
   Make sure the filter A can be seen from the lens mount. At this time, do not care whether the filter knob stops at its click position, or not.

2. Set S1 on DR-302 board to LOCAL.
   Rotate the knob shaft with a flatblade screwdriver to put it into the click position.
   (This position is assumed to be filter number A.)
   Rotate the knob shaft lightly in clockwise and counter-clockwise directions within the range of click state, and adjust the position of the shaft in the center of the play.

3. Adjust ⊘RV3 [B2] so that the specifications are satisfied.

Equipment : Digital voltmeter
Test point : TP4 [C3] (GND : TP1 [C1])/DR-302
Specifications : 0 ±0.50 V

4. Adjust the stop position of each filter listed below in the same way, when selecting the filter select buttons B, C and D of MSU (or RCP). (Repeat Steps 1 to 3.)

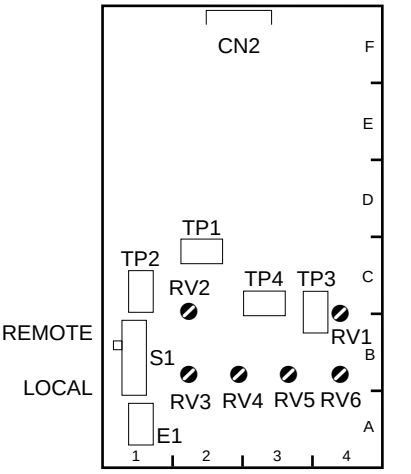
Test point :TP4 [C3] (GND : TP1 [C2])/DR-302

Filter Select Button of MSU/RCP	Filter No.	Adj.point	Spec.
A	A	⊘RV3 [B2]	0 ±0.50 V
B	B	⊘RV4 [B3]	
C	C	⊘RV5 [B3]	
D	D	⊘RV6 [B4]	

5. Set S1 on DR-302 board to REMOTE.
   Select the filter buttons A to D of MSU (or RCP) sequentially.
   Make sure that the filter No. changes properly corresponding to selected button. (See the list in Step 4.)

Note

Make sure the filter No. just stops at the click position.



DR-302 Board (A SIDE)

2-4. DR-306 board Adjustment (For OHB-405WS/405WSP/500/500P/500WS/500WSP)

Note:
When the filter servo board DR-306 is replaced, or the filter disk improperly operates, the following adjustment is required.

Equipment: Digital voltmeter

Preparations:
1. Install the OHB without the shielding case into the BVP-500/500P
2. Open the right side panel of the BVP-500/500P.
3. Turn on the power of the BVP-500/500P.

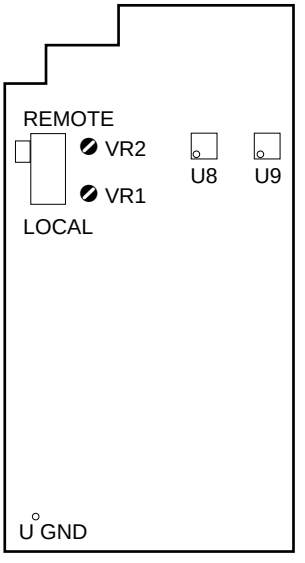
Adjustment Procedures:

1. Power Supply Adjustment (for IC, U8)

Test point : Pin 2 of U8(GND: UGND)/DR-306
Adjustment point : ⊘VR1/DR-306
Specifications : 7.4 ±0.1 Vdc

2. Power Supply Adjustment (for IC, U9)

Test point : Pin 2 of U9(GND: UGND)/DR-306
Adjustment point : ⊘VR2/DR-306
Specifications : 7.4 ±0.1 Vdc



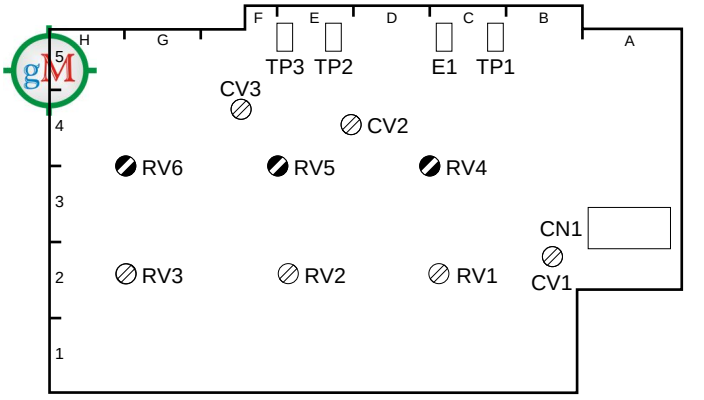
DR-306 Board (A SIDE)

2-5. PA Gain Adjustment (For BVP-550/550P/570)

Equipment: Waveform monitor

Preparations:
- Extend the OHB with the OHB fiximg tool. (As for how to attach the OHB fixing tool, refer to section 2-1-2.)
- Extend the VA-163/163A board of BVP-550/550P/570 with EX-464 extension board.
- Connect a waveform monitor to the TEST OUT connector.
- Set the WHITE BAL switch on the side panel of the BVP-550/550P/570 to PRST.
- Open the BLACK SHADING page of the MAINTENANCE menu and set MASTER GAIN to 0 dB.

Adjustment points:
⊘RV6 [H3] (R GAIN)/PA-181/213
⊘RV5 [F3] (G GAIN)/PA-181/213
⊘RV4 [C3] (B GAIN)/PA-181/213
Object: Gray-scale chart



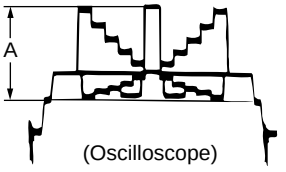
PA-181/213 Board (B SIDE)

Adjustment Procedures:

1. Set the AUTO W/B BAL switch on the front panel to BLK to automatically adjust the black balance.
2. Set the ENC/RGB switch on the side panel to RGB.
3. Set the RGB switch on the side panel to G ch.
4. Open the BLACK SHADING page of the MAINTENANCE menu and see BLACK [M] to 3 IRE for NTSC or 35 mV for PAL.
5. Open the KNEE/W CLIP page of the PAINT menu and set KNEE to OFF.
6. Connect the oscilloscope to pin72 (GND: pin71, Trig: pin8)/extension board (extending VA-163/163A).
7. Turn ◓RV5 [F3] (G GAIN)/PA-181/213 fully clockwise.
8. Shoot the gray-scale chart so that the chart frame is aligned with the underscanned monitor frame.

Test point : pin72/extension board (extending VA-163/163A)
Adjustment point : Adjust the iris control of the lens.
Specification :

Model	Specification
OHB-455WS OHB-455WSP	A = 190 mV
OHB-550 OHB-550P OHB-550WS OHB-550WSP OHB-450 OHB-450P OHB-451 OHB-451P	A = 230 mV

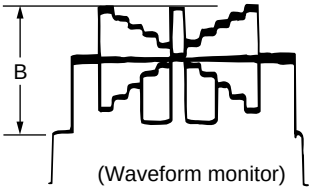


(Oscilloscope)

Note

Do not change the lens iris until the PA board adjustment is finished.

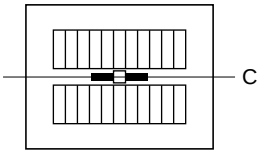
Test point : TEST OUT connector/BVP
Adjustment point : ◓RV5 [F3] (G GAIN)/PA-181/213
Specifications : B = 92.5 ±2.0 IRE (for NTSC)
B = 700 ±14 mV (for PAL)



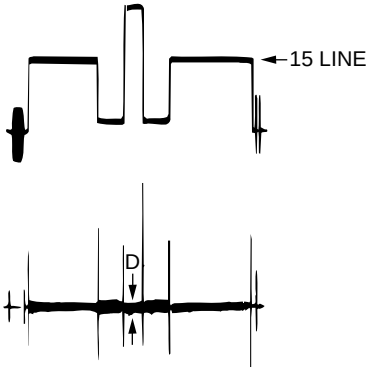
(Waveform monitor)

9. Set the ENC/RGB switch on the side panel to ENC.
10. Open the GAMMA page of the PAINT menu and set GAMMA to OFF.
11. Put the waveform monitor into 15 lines and observe portion C on the monitor.
12. Put the waveform monitor into the CHROMA mode.

Test point : TEST OUT connector/BVP
Adjustment point : ◓RV6 [H3] (R GAIN)/PA-181/213
◓RV4 [C3] (B GAIN)/PA-181/213
Specifications : Minimize the carrier leakage D.

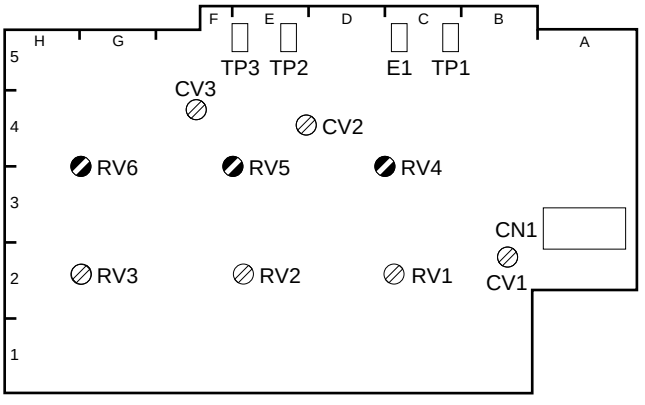


(Monitor Screen)



D=MINIMUM
(Waveform monitor)

13. After the adjustment, set the menu as follows.
GAMMA → ON
KNEE → ON



PA-181/213 Board (B SIDE)

2-6. DR-302 board Adjustment (For OHB-451/451P)

Notes:
- When the filter servo board DR-302 is replaced or the filter disk improperly operates, the following adjustment is required.
- Make sure that the filter knob is installed correctly. (Refer to "1-4. Position Alignment of Filter Knobs".)

Equipment: Digital voltmeter

Preparations:
1. Install the OHB-451/451P into the BVP-550/550P/570.
2. Open the right side panel of BVP-550/550P/570. Set S1 on DR-302 board to LOCAL.
3. Turn on the power of the BVP-550/550P/570.

2-6-1. Filter Follower Voltage Adjustment

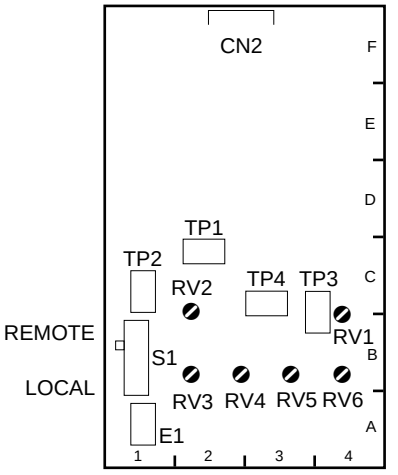
Adjustment Procedures:
1. Adjust controls so that the specifications are satisfied when aligning the indication of the filter knob to the position listed below.

Test point : TP2 [C1] (GND:E1 [A1])/DR-302

Filter Knob Indication	Adj.point	Spec.
1	⊘RV2 [C2] /DR-302	4.45 ±0.10 V
4	⊘RV1 [C4] /DR-302	0.55 ±0.10 V

Note

Perform this adjustment several times until the specifications are satisfied, because the adjustments of ⊘RV2 and ⊘RV1 influence each other.



DR-302 Board (A SIDE)

2-6-2. Filter Servo Adjustment

Adjustment Procedures:
1. Set S1 on DR-302 board to REMOTE. Select the filter select button "A" of MSU (or RCP).

   Notes

   At this time, do not care whether the filter knob stops at its click position, or not.

2. Set S1 on DR-302 board to LOCAL. Set the indication of the filter knob to 1. Perform a fine adjustment so that the filter knob just stops at the click position.

3. Adjust ⊘RV3 [B2] so that the specifications are satisfied.

Equipment : Digital voltmeter
Test point : TP4 [C3] (GND: TP1 [C2])/DR-302
Specifications : 0 ±0.50 V

4. Adjust the stop position of each filter knob listed below in the same way, when selecting the filter select buttons B, C, and D of MSU (or RCP). (Repeat Steps 1 to 3.)

Test point : TP4 [C3] (GND: TP1 [C1])/DR-302

Filter Select Button of MSU/RCP	Filter No.	Adj.point	Spec.
A	1	⊘RV3 [B2]	0 ±0.50 V
B	2	⊘RV4 [B3]	
C	3	⊘RV5 [B3]	
D	4	⊘RV6 [B4]	

5. Set S1 on DR-302 board to REMOTE. Select the filter buttons A to D of MSU (or RCP) sequentially. Make sure that the indication of filter knob changes properly corresponding to selected button. (See the list in Step 4.)

   Note

   Make sure the filter knob just stops at the click position.

Section 3
Spare Parts

3-1. Notes on Repair Parts

1. Standardization of Parts

Some repair parts supplied by Sony differ from those used for the unit. These are because of parts commonality and improvement.

Parts list has the present standardized repair parts.

2. Stock of Parts

Parts marked with “o” at SP(Supply Code) column of the spare parts list may be not stocked. Therefore, the delivery date will be delayed.

3. Units Representation

The following represented units are changed or omitted in writing.

Units		Representation
Capacitance	μF	uF
Inductance	μH	uH
Resistance	Ω	Abbreviation
Temperature	°C	XXX-DEG-C

4. Destination Representation

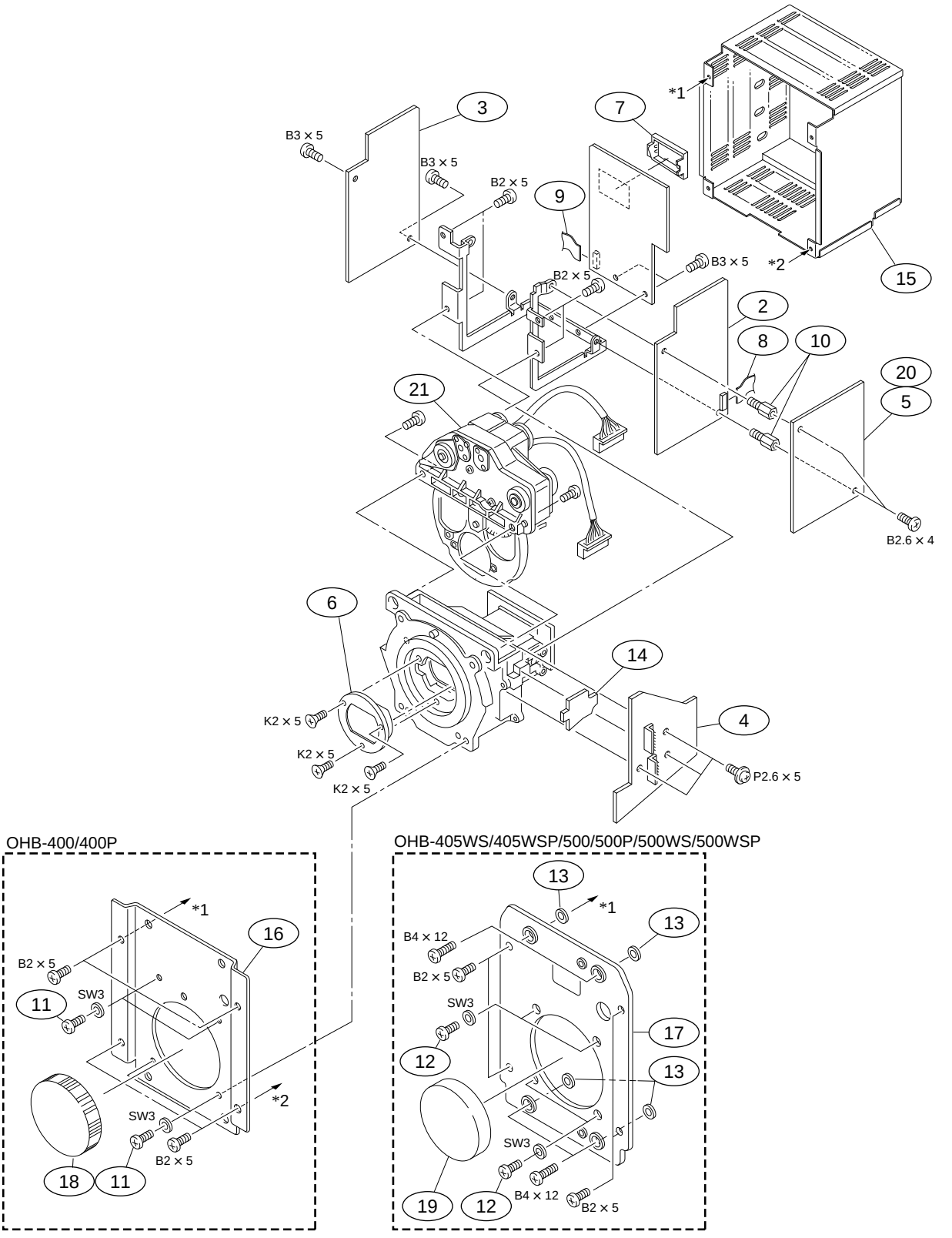
The part indicated “For J/UC/CE” in the spare parts list is used in the unit written below.

For J : The part is used in a unit for Japan.

For UC : The part is used in a unit for the U.S.A. and Canada.

For CE : The part is used in a unit for regions except the above countries.

3-2. Exploded View



http://getMANUAL.com

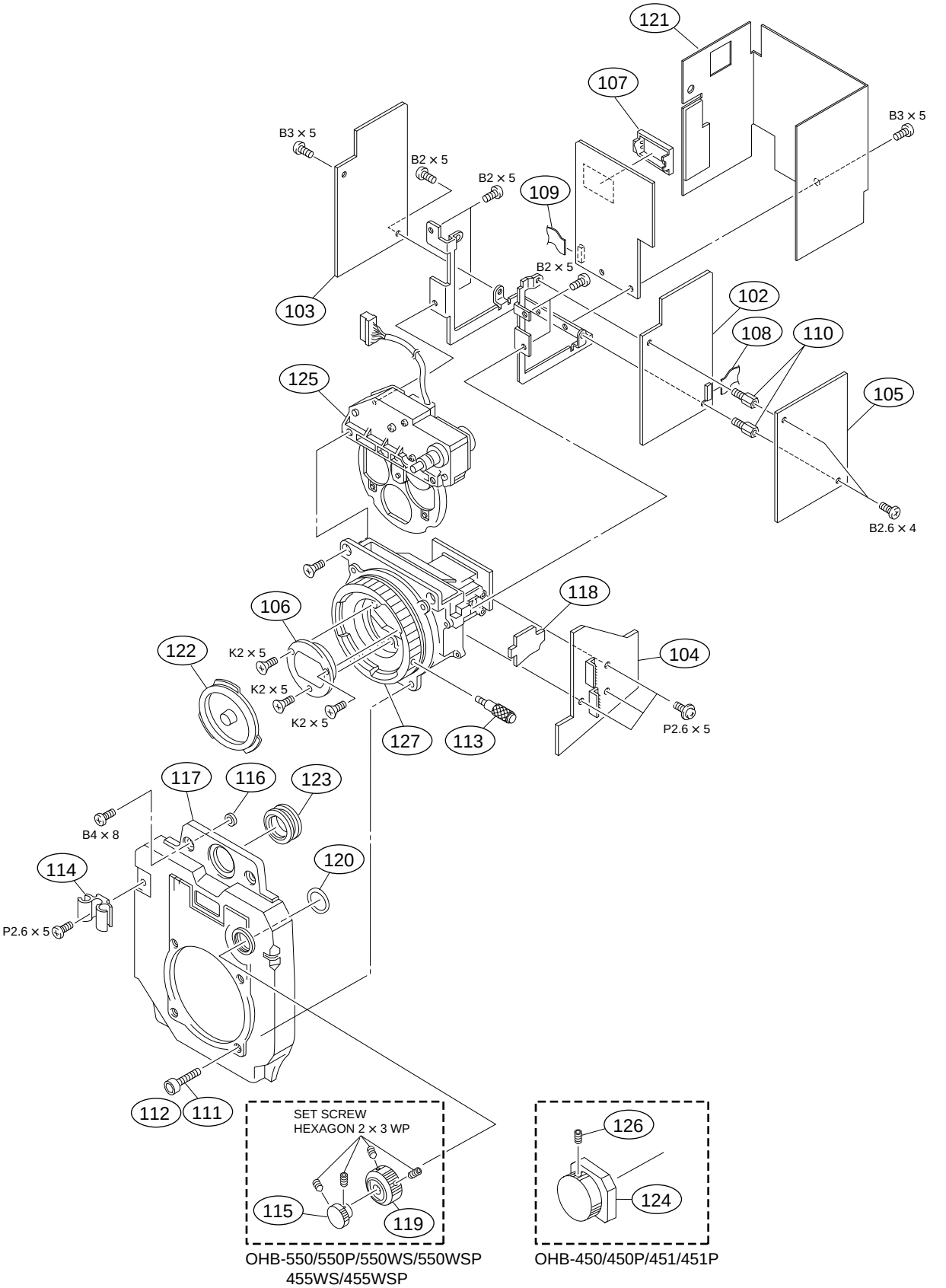
No.	Part No.	SP	Description
2	A-8269-286-A	o	MOUNTED CIRCUIT BOARD, DR-271 (F) (FOR OHB-500/500P/500WS/500WSP)
	A-8269-315-A	o	MOUNTED CIRCUIT BOARD, DR-271 (I) (FOR OHB-400/400P/405WS/405WSP)
3	A-8269-314-A	o	MOUNTED CIRCUIT BOARD, PA-181 (FOR OHB-400/400P/500/500P/500WS /500WSP)
	A-8316-161-A	o	MOUNTED CIRCUIT BOARD, PA-213 (FOR OHB-405WS/405WSP)
4	A-8269-325-A	o	MOUNTED CIRCUIT BOARD, CN-1119 (FOR OHB-400/400P/500/500P) (FOR OHB-500WS/500WSP) *1
	A-8320-804-A	o	MOUNTED CIRCUIT BOARD, CN-1119A (FOR OHB-405WS/405WSP) (FOR OHB-500WS/500WSP) *2
5	A-8269-852-A	o	MOUNTED CIRCUIT BOARD, DR-302 (FOR OHB-400/400P)
6	1-467-820-11	o	FILTER UNIT, OPTICAL (FOR OHB-405WSP/500WSP)
	1-467-820-21	o	FILTER UNIT, OPTICAL (FOR OHB-405WS/500WS)
	1-547-579-11	o	FILTER UNIT, OPTICAL (FOR OHB-500P)
	1-547-579-21	o	FILTER UNIT, OPTICAL (FOR OHB-500)
	1-547-845-11	o	FILTER UNIT, OPTICAL (FOR OHB-400P)
	1-547-845-21	o	FILTER UNIT, OPTICAL (FOR OHB-400)
7	1-540-194-12	s	SOCKET, IC
8	1-775-779-11	s	CABLE, FLEXIBLE FLAT (20 CORE)
9	1-775-780-11	s	CABLE, FLEXIBLE FLAT (24 CORE)
10	2-270-601-00	o	SUPPORT
11	2-623-773-01	s	BOLT (M3X6), STAINLESS (FOR OHB-400/400P)
12	2-623-773-11	s	BOLT (M3X8), STAINLESS (FOR OHB-405WS/405WSP/500/500P /500WS/500WSP)
13	3-687-116-01	o	WASHER (4), STOPPER
14	3-692-194-01	o	SHEET,HEAT RESISTING (CN) (FOR OHB-400/400P)
	3-695-881-01	o	SHEET,HEAT RESISTING (FOR OHB-405WS/405WSP/500/500P /500WS/500WSP)
15	3-693-324-01	o	CASE,OHB SHIELD
16	3-693-325-01	o	PANEL, OHB, IT (FOR OHB-400/400P)
17	3-693-326-02	o	PANEL, OHB, FIT (FOR OHB-405WS/405WSP/500/500P /500WS/500WSP)
18	3-709-068-01	o	CAP, DUST (FOR OHB-400/400P)
19	3-709-069-01	o	CAP, DUST (FOR OHB-405WS/405WSP/500/500P /500WS/500WSP)
20	9-933-969-01	o	MOUNTED CIRCUIT BOARD, DR-306 (FOR OHB-405WS/405WSP/500/500P /500WS/500WSP)
21	SERVO FILTER UNIT		BKDW-701 (STANDARD PRODUCT) (FOR OHB-405WS/405WSP/500/500P /500WS/500WSP)

*1 Apllicable Serial No.

OHB-500WS (UC) :10001 through 11000
OHB-500WS (J) :30001 through 31000
OHB-500WSP (CE):40001 through 41000

*2 Apllicable Serial No.

OHB-500WS (UC) :11001 and higher
OHB-500WS (J) :31001 and higher
OHB-500WSP (CE):41001 and higher


121
107
B3 × 5
B2 × 5
B2 × 5
109
B3 × 5
B2 × 5
103
102
108
110
125
105
B2.6 × 4
106
118
122
K2 × 5
K2 × 5
K2 × 5
104
P2.6 × 5
127
113
117
116
123
B4 × 8
114
120
P2.6 × 5
112
111
SET SCREW
HEXAGON 2 × 3 WP
115
119
126
124
OHB-550/550P/550WS/550WSP
455WS/455WSP
OHB-450/450P/451/451P

No.	Part No.	SP	Description
102	A-8269-286-A	o	MOUNTED CIRCUIT BOARD, DR-271 (F) (FOR OHB-550/550P/550WS/550WSP)
	A-8269-315-A	o	MOUNTED CIRCUIT BOARD, DR-271 (I) (FOR OHB-450/450P/451/451P/455WS /455WSP)
103	A-8269-314-A	o	MOUNTED CIRCUIT BOARD, PA-181 (FOR OHB-450/450P/451/451P/550/550P /550WS/550WSP)
	A-8316-161-A	o	MOUNTED CIRCUIT BOARD, PA-213 (FOR OHB-455WS/455WSP)
104	A-8269-325-A	o	MOUNTED CIRCUIT BOARD, CN-1119 (FOR OHB-450/450P/451/451P/550/550P) (FOR OHB-550WS/550WSP) *2
	A-8320-804-A	o	MOUNTED CIRCUIT BOARD, CN-1119A (FOR OHB-455WS/455WSP/550WS/550WSP) (FOR OHB-550WS/550WSP) *3
105	A-8269-852-A	o	MOUNTED CIRCUIT BOARD, DR-302 (FOR OHB-451/451P)
106	1-467-820-11	o	FILTER UNIT, OPTICAL (FOR OHB-455WSP/550WSP)
	1-467-820-21	o	FILTER UNIT, OPTICAL (FOR OHB-455WS/550WS)
	1-547-579-11	o	FILTER UNIT, OPTICAL (FOR OHB-550P)
	1-547-579-21	o	FILTER UNIT, OPTICAL (FOR OHB-550)
	1-547-845-11	o	FILTER UNIT, OPTICAL (FOR OHB-450P/451P)
	1-547-845-21	o	FILTER UNIT, OPTICAL (FOR OHB-450/451)
107	1-540-194-12	s	SOCKET, IC
108	1-782-696-11	s	CABLE, FLEXIBLE FLAT (20 CORE) *1
109	1-782-699-11	s	CABLE, FLEXIBLE FLAT (24 CORE) *1
110	2-270-601-00	o	SUPPORT
111	2-623-773-01	s	BOLT (M3X6), STAINLESS (FOR OHB-451/451P/450/450P)
112	2-623-773-11	s	BOLT (M3X8), STAINLESS (FOR OHB-455WS/455WSP/550/550P /550WS/550WSP)
113	3-678-629-00	s	LEVER, MOUNT
114	3-679-659-03	o	CLAMP,CABLE
115	3-679-670-03	s	KNOB,FILTER(ND)
116	3-687-116-01	o	WASHER (4), STOPPER
117	3-692-188-01	o	PANEL,FRONT
118	3-692-194-01	o	SHEET,HEAT RESISTING (CN) (FOR OHB-450/450P/451/451P)
	3-695-881-01	o	SHEET,HEAT RESISTING (FOR OHB-455WS/455WSP/550/550P /550WS/550WSP)
119	3-692-196-01	s	KNOB,FILTER(CC)
120	3-693-331-01	o	SHEET, DROP PROTECTION (FL)
121	X-3678-510-4	o	COVER DR ASSY
122	3-699-048-01	s	CAP, MOUNT
123	3-710-024-01	o	PACKING, VF
124	3-710-054-01	s	KNOB,FILTER
125	1-475-492-11	o	FILTER DISK UNIT (FOR OHB-455WS/455WSP/550/550P /550WS/550WSP)
126	3-701-505-00	s	SETSCREW, DOUBLE POINT 3X3
127	3-186-442-01	o	RING, MOUNT (FOR OHB-455WS/455WSP/550/550P /550WS/550WSP)
	3-709-101-01	o	RING, BAYONET (FOR OHB-450/450P/451/451P)

*1 Apllicable Serial No.

OHB-450 (UC) :10481 and higher
OHB-450 (J) :30066 and higher
OHB-450P (CE):40501 and higher

OHB-451 (UC) :10111 and higher
OHB-451 (J) :30041 and higher
OHB-451P (CE):40131 and higher

OHB-455WS (UC) :10001 and higher
OHB-455WS (J) :30001 and higher
OHB-455WSP (CE):40001 and higher

OHB-550 (UC) :10431 and higher
OHB-550 (J) :30166 and higher
OHB-550P (CE):40501 and higher

OHB-550WS (UC) :10106 and higher
OHB-550WS (J) :30106 and higher
OHB-550WSP (CE):40361 and higher

*2 Apllicable Serial No.

OHB-550WS (UC) :10001 through 11000
OHB-550WS (J) :30001 through 31000
OHB-550WSP (CE):40001 through 41000

*3 Apllicable Serial No.

OHB-550WS (UC) :11001 and higher
OHB-550WS (J) :31001 and higher
OHB-550WSP (CE):41001 and higher

No.	Part No.	SP	Description
	7-621-732-09	s	SET-SCT HEX. 2X3 WP
	7-621-771-06	s	SCREW +B 2X5
	7-621-772-20	s	SCREW +B 2X5
	7-621-773-86	s	SCREW +B 2.6X4
	7-623-208-22	o	SW 3,TYPE 2
	7-627-452-38	s	SCREW,PRECISION +K 2X5
	7-627-553-67	s	SCREW,PRECISION +P 2X5
	7-627-556-38	s	SCREW +P 2.6X4.0
	7-627-556-57	s	PRECISION SCREW +P 2.6X5 TYPE1
	7-627-556-58	s	SCREW +P 2.6X5
	7-682-546-04	s	SCREW +B 3X5
	7-682-561-09	s	SCREW +B 4X8
	7-682-563-04	s	SCREW +B 4X12
	7-688-004-11	s	W 4, MIDDLE

3-3. Electrical Parts List

CN-1119/1119A Board

Ref. No. or Q'ty	Part No.	SP	Description
∗1 for OHB-400/400P/450/450P/451/451P for OHB-500/500P/550/550P/500WS/500WSP/550WS/550WSP			
∗2 for OHB-405WS/405WSP/455WS/455WSP for OHB-500WS/500WSP/550WS/550WSP			
#1pc ∗1	A-8269-325-A	o	MOUNTED CIRCUIT BOARD CN-1119
#1pc ∗2	A-8320-804-A	o	MOUNTED CIRCUIT BOARD CN-1119A
C1	1-126-936-11	s	ELECT 3300uF 20% 16V
C2	1-163-275-11	s	CERAMIC, CHIP 0.001uF 5% 50V
C3	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C4	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C5	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C6	1-135-166-21	s	TANTALUM, CHIP 47uF 10% 10V
C7	1-135-166-21	s	TANTALUM, CHIP 47uF 10% 10V
C8	1-163-275-11	s	CERAMIC, CHIP 0.001uF 5% 50V
C9	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C10	1-163-275-11	s	CERAMIC, CHIP 0.001uF 5% 50V
C11	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
CN1	1-770-678-11	o	CONNECTOR, BOARD TO BOARD 50P
CN2	1-695-950-21	o	CONNECTER, FPC (ZIF) 21P
CN3	1-695-950-21	o	CONNECTER, FPC (ZIF) 21P
CN4	1-695-950-21	o	CONNECTER, FPC (ZIF) 21P
D1	8-719-104-34	s	DIODE 1S2835
D2	8-719-800-76	s	DIODE 1SS226
D3	8-719-800-76	s	DIODE 1SS226
D4	8-719-800-76	s	DIODE 1SS226
D5	8-719-800-76	s	DIODE 1SS226
D6	8-719-800-76	s	DIODE 1SS226
D7	8-719-800-76	s	DIODE 1SS226
D8	8-719-104-34	s	DIODE 1S2835
D9	8-719-104-34	s	DIODE 1S2835
IC1	8-759-242-51	s	IC TC74AC86F
IC2	8-759-242-51	s	IC TC74AC86F
R1	1-216-683-11	s	METAL, CHIP 22K 0.50% 1/10W
R2	1-216-688-11	s	METAL, CHIP 36K 0.50% 1/10W
R3	1-216-699-11	s	METAL, CHIP 100K 0.50% 1/10W
R4	1-216-603-11	s	METAL, CHIP 10 0.50% 1/10W
R5 ∗1	1-216-607-11	s	METAL, CHIP 15 0.50% 1/10W
R5 ∗2	1-216-309-00	s	METAL, CHIP 5.6 5% 1/10W
R6 ∗1	1-216-607-11	s	METAL, CHIP 15 0.50% 1/10W
R6 ∗2	1-216-309-00	s	METAL, CHIP 5.6 5% 1/10W
R7 ∗1	1-216-607-11	s	METAL, CHIP 15 0.50% 1/10W
R7 ∗2	1-216-309-00	s	METAL, CHIP 5.6 5% 1/10W
R8 ∗1	1-216-607-11	s	METAL, CHIP 15 0.50% 1/10W
R8 ∗2	1-216-309-00	s	METAL, CHIP 5.6 5% 1/10W
R9 ∗1	1-216-607-11	s	METAL, CHIP 15 0.50% 1/10W
R9 ∗2	1-216-309-00	s	METAL, CHIP 5.6 5% 1/10W
R10 ∗1	1-216-607-11	s	METAL, CHIP 15 0.50% 1/10W
R10 ∗2	1-216-309-00	s	METAL, CHIP 5.6 5% 1/10W
R11	1-216-683-11	s	METAL, CHIP 22K 0.50% 1/10W
R12	1-216-688-11	s	METAL, CHIP 36K 0.50% 1/10W
R13	1-216-699-11	s	METAL, CHIP 100K 0.50% 1/10W
R14	1-216-683-11	s	METAL, CHIP 22K 0.50% 1/10W
R15	1-216-688-11	s	METAL, CHIP 36K 0.50% 1/10W
R16	1-216-699-11	s	METAL, CHIP 100K 0.50% 1/10W
R18	1-216-295-11	s	METAL, CHIP 0 5% 1/10W

DR-271(F) Board For OHB-500/500P/500WS/500WSP For OHB-550/550P/550WS/550WSP

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-8269-286-A	o	MOUNTED CIRCUIT BOARD DR-271(F)
C1	1-107-889-11	s	ELECT 220uF 20% 25V
C2	1-135-211-11	s	TANTALUM, CHIP 6.8uF 20% 6.3V
C3	1-127-518-11	s	ALUMN SOLID 100uF 20% 16V
C4	1-127-518-11	s	ALUMN SOLID 100uF 20% 16V
C5	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C6	1-135-210-11	s	TANTALUM, CHIP 4.7uF 20% 10V
C7	1-126-936-11	s	ELECT 3300uF 20% 16V
C8	1-162-927-11	s	CERAMIC, CHIP 100PF 5% 50V
C9	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C10	1-126-948-11	s	ELECT 100uF 20% 35V
C11	1-162-964-11	s	CERAMIC, CHIP 0.001uF 10% 50V
C12	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C13	1-135-210-11	s	TANTALUM, CHIP 4.7uF 20% 10V
C14	1-135-179-21	s	TANTALUM, CHIP 2.2uF 10% 16V
C15	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C16	1-135-136-21	s	TANTALUM, CHIP 6.8uF 10% 35V
C17	1-135-212-21	s	TANTALUM, CHIP 2.2uF 20% 35V
C18	1-135-179-21	s	TANTALUM, CHIP 2.2uF 10% 16V
C20	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C21	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C23	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C24	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C25	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C26	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C27	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C28	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C29	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C30	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C31	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C32	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C33	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C34	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C35	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C36	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C37	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C38	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C39	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C40	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C41	1-162-964-11	s	CERAMIC, CHIP 0.001uF 10% 50V
C42	1-162-964-11	s	CERAMIC, CHIP 0.001uF 10% 50V
C43	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C44	1-135-164-21	s	TANTALUM, CHIP 22uF 10% 16V
CN1	1-691-942-11	s	CONNECTOR, BOARD TO BOARD 30P
CN3	1-774-260-11	o	CONNECTOR, FFC (ZIF) 20P
CN4	1-573-310-11	s	CONNECTOR, BOARD TO BOARD 20P
CN5	1-695-442-21	o	PIN, CONNECTOR (PC BOARD) 10P
D1	8-719-029-57	s	DIODE RD2.4UH-T1
D2	8-719-800-76	s	DIODE 1SS226
D3	8-719-801-78	s	DIODE 1SS184
D4	8-719-800-76	s	DIODE 1SS226
D5	8-719-029-61	s	DIODE RD3.6UH-T1
D6	8-719-800-76	s	DIODE 1SS226
IC1	8-759-929-21	s	IC TLC27L2CPS
IC2	8-759-058-62	s	IC TC7S08FU(TE85R)
IC3	8-759-073-52	s	IC TC74AC04F-EL
IC4	8-759-979-69	s	IC TSC426C0A

NOTE : For the parts marked # in the parts list, refer to Section 3-6 “Changed Parts”.

(DR-271(F) Board)

Ref. No. or Q'ty	Part No.	SP	Description
IC5	8-759-906-54	s	IC TL064CNS
IC6	8-759-635-27	s	IC M62352GP
IC7	8-759-175-04	s	IC PCF8574T-T
IC8	8-759-082-60	s	IC TC7S66FU
IC9	8-759-082-60	s	IC TC7S66FU
IC10	8-759-172-33	s	IC UPD16502GS(1)
IC11	8-759-172-33	s	IC UPD16502GS(1)
IC12	8-759-172-33	s	IC UPD16502GS(1)
IC13	8-759-172-33	s	IC UPD16502GS(1)
IC14	8-759-172-33	s	IC UPD16502GS(1)
IC15	8-759-172-33	s	IC UPD16502GS(1)
L1	1-410-737-31	s	INDUCTOR CHIP 0.47uH
Q1	8-729-141-48	s	TRANSISTOR 2SB624-BV345
Q2	8-729-122-63	s	TRANSISTOR 2SA1226
Q3	8-729-421-71	s	TRANSISTOR 2SK620
Q4	8-729-141-48	s	TRANSISTOR 2SB624-BV345
R4	1-218-692-11	s	METAL, CHIP 1K 0.50% 1/16W
R5	1-218-724-11	s	METAL, CHIP 22K 5% 1/16W
R6	1-218-721-11	s	METAL, CHIP 16K 0.50% 1/16W
R7	1-220-232-11	s	METAL, CHIP 3.3 10% 1/4W
R8	1-218-652-11	s	METAL, CHIP 22 0.50% 1/16W
R9	1-218-728-11	s	METAL, CHIP 33K 0.50% 1/16W
R10	1-218-728-11	s	METAL, CHIP 33K 0.50% 1/16W
R11	1-218-728-11	s	METAL, CHIP 33K 0.50% 1/16W
R12	1-218-728-11	s	METAL, CHIP 33K 0.50% 1/16W
R13	1-218-728-11	s	METAL, CHIP 33K 0.50% 1/16W
R14	1-218-728-11	s	METAL, CHIP 33K 0.50% 1/16W
R15	1-218-728-11	s	METAL, CHIP 33K 0.50% 1/16W
R16	1-218-728-11	s	METAL, CHIP 33K 0.50% 1/16W
R17	1-218-728-11	s	METAL, CHIP 33K 0.50% 1/16W
R18	1-218-728-11	s	METAL, CHIP 33K 0.50% 1/16W
R19	1-218-644-11	s	METAL, CHIP 10 0.50% 1/16W
R20	1-218-644-11	s	METAL, CHIP 10 0.50% 1/16W
R21	1-218-740-11	s	METAL, CHIP 100K 0.50% 1/16W
R22	1-218-644-11	s	METAL, CHIP 10 0.50% 1/16W
R23	1-218-716-11	s	METAL, CHIP 10K 0.50% 1/16W
R24	1-218-692-11	s	METAL, CHIP 1K 0.50% 1/16W
R25	1-218-668-11	s	METAL, CHIP 100 0.50% 1/16W
R26	1-218-851-11	s	METAL, CHIP 1.5K 0.50% 1/16W
R27	1-218-648-11	s	METAL, CHIP 15 0.50% 1/16W
R28	1-218-648-11	s	METAL, CHIP 15 0.50% 1/16W
R29	1-218-716-11	s	METAL, CHIP 10K 0.50% 1/16W
R30	1-218-711-11	s	METAL, CHIP 6.2K 0.50% 1/16W
R31	1-218-740-11	s	METAL, CHIP 100K 0.50% 1/16W
R32	1-218-751-11	s	METAL, CHIP 300K 0.50% 1/16W
R33	1-218-655-91	s	METAL, CHIP 30 0.50% 1/16W
R34	1-218-668-11	s	METAL, CHIP 100 0.50% 1/16W
R35	1-218-644-11	s	METAL, CHIP 10 0.50% 1/16W
R36	1-218-644-11	s	METAL, CHIP 10 0.50% 1/16W
#R37	1-218-688-11	s	METAL, CHIP 680 0.50% 1/16W
R38	1-218-729-11	s	METAL, CHIP 36K 0.50% 1/16W
R39	1-218-723-11	s	METAL, CHIP 20K 0.50% 1/16W
R40	1-218-732-11	s	METAL, CHIP 47K 0.50% 1/16W
R41	1-218-723-11	s	METAL, CHIP 20K 0.50% 1/16W
R42	1-218-732-11	s	METAL, CHIP 47K 0.50% 1/16W
R43	1-218-723-11	s	METAL, CHIP 20K 0.50% 1/16W

(DR-271(F) Board)

Ref. No. or Q'ty	Part No.	SP	Description
R44	1-218-732-11	s	METAL, CHIP 47K 0.50% 1/16W
R50	1-218-748-11	s	METAL, CHIP 220K 0.50% 1/16W
R51	1-218-748-11	s	METAL, CHIP 220K 0.50% 1/16W
R52	1-218-748-11	s	METAL, CHIP 220K 0.50% 1/16W
R53	1-218-748-11	s	METAL, CHIP 220K 0.50% 1/16W
R54	1-218-724-11	s	METAL, CHIP 22K 5% 1/16W
R55	1-218-724-11	s	METAL, CHIP 22K 5% 1/16W
R56	1-218-724-11	s	METAL, CHIP 22K 5% 1/16W
R57	1-218-724-11	s	METAL, CHIP 22K 5% 1/16W
R59	1-218-716-11	s	METAL, CHIP 10K 0.50% 1/16W
R60	1-218-716-11	s	METAL, CHIP 10K 0.50% 1/16W
R61	1-218-701-11	s	METAL, CHIP 2.4K 0.50% 1/16W
R62	1-218-712-11	s	METAL, CHIP 6.8K 0.50% 1/16W
R63	1-218-720-11	s	METAL, CHIP 15K 0.50% 1/16W
R64	1-218-730-11	s	METAL, CHIP 39K 0.50% 1/16W
R65	1-218-701-11	s	METAL, CHIP 2.4K 0.50% 1/16W
R66	1-218-712-11	s	METAL, CHIP 6.8K 0.50% 1/16W
R67	1-218-720-11	s	METAL, CHIP 15K 0.50% 1/16W
R68	1-218-730-11	s	METAL, CHIP 39K 0.50% 1/16W
R69	1-218-668-11	s	METAL, CHIP 100 0.50% 1/16W
R70	1-218-668-11	s	METAL, CHIP 100 0.50% 1/16W
R71	1-218-708-11	s	METAL, CHIP 4.7K 0.50% 1/16W
R72	1-216-864-11	s	METAL, CHIP 0 5% 1/16W
R74	1-216-864-11	s	METAL, CHIP 0 5% 1/16W
R75	1-216-864-11	s	METAL, CHIP 0 5% 1/16W
R76	1-216-864-11	s	METAL, CHIP 0 5% 1/16W
R77	1-216-864-11	s	METAL, CHIP 0 5% 1/16W
R78	1-216-864-11	s	METAL, CHIP 0 5% 1/16W
R79	1-216-864-11	s	METAL, CHIP 0 5% 1/16W
R80	1-216-864-11	s	METAL, CHIP 0 5% 1/16W
R81	1-216-864-11	s	METAL, CHIP 0 5% 1/16W
R90	1-216-864-11	s	METAL, CHIP 0 5% 1/16W
R91	1-216-864-11	s	METAL, CHIP 0 5% 1/16W
R92	1-216-864-11	s	METAL, CHIP 0 5% 1/16W
R93	1-216-864-11	s	METAL, CHIP 0 5% 1/16W
R94	1-216-864-11	s	METAL, CHIP 0 5% 1/16W
R95	1-216-864-11	s	METAL, CHIP 0 5% 1/16W
R97	1-218-668-11	s	METAL, CHIP 100 0.50% 1/16

NOTE : For the parts marked # in the parts list, refer to Section 3-6 “Changed Parts”.

DR-271(I) Board For OHB-400/400P/405WS/405WSP
--- For OHB-450/450P/451/451P/455WS/455WSP

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-8269-315-A	o	MOUNTED CIRCUIT BOARD, DR-271(I)
C1	1-107-889-11	s	ELECT 220uF 20% 25V
C2	1-135-211-11	s	TANTALUM, CHIP 6.8uF 20% 6.3V
C3	1-127-518-11	s	ALUMN SOLID 100uF 20% 16V
C4	1-127-518-11	s	ALUMN SOLID 100uF 20% 16V
C5	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C6	1-135-210-11	s	TANTALUM, CHIP 4.7uF 20% 10V
C7	1-126-936-11	s	ELECT 3300uF 20% 16V
C8	1-162-927-11	s	CERAMIC, CHIP 100PF 5% 50V
C9	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C10	1-126-948-11	s	ELECT 100uF 20% 35V
C11	1-162-964-11	s	CERAMIC, CHIP 0.001uF 10% 50V
C12	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C13	1-135-210-11	s	TANTALUM, CHIP 4.7uF 20% 10V
C14	1-135-179-21	s	TANTALUM, CHIP 2.2uF 10% 16V
C15	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C16	1-135-136-21	s	TANTALUM, CHIP 6.8uF 10% 35V
C17	1-135-212-21	s	TANTALUM, CHIP 2.2uF 20% 35V
C18	1-135-179-21	s	TANTALUM, CHIP 2.2uF 10% 16V
C20	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C21	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C23	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C24	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C25	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C26	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C27	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C28	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C29	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C30	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C31	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C32	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C33	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C34	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C35	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C36	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C37	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C38	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C39	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C40	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C41	1-162-964-11	s	CERAMIC, CHIP 0.001uF 10% 50V
C42	1-162-964-11	s	CERAMIC, CHIP 0.001uF 10% 50V
C43	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C44	1-135-164-21	s	TANTALUM, CHIP 22uF 10% 16V
CN1	1-691-942-11	s	CONNECTOR, BOARD TO BOARD 30P
CN3	1-774-260-11	o	CONNECTOR, FFC (ZIF) 20P
CN4	1-573-310-11	s	CONNECTOR, BOARD TO BOARD 20P
CN5	1-695-442-21	o	PIN, CONNECTOR (PC BOARD) 10P
D1	8-719-029-57	s	DIODE RD2.4UH-T1
D2	8-719-800-76	s	DIODE 1SS226
D3	8-719-801-78	s	DIODE 1SS184
D4	8-719-800-76	s	DIODE 1SS226
D5	8-719-029-61	s	DIODE RD3.6UH-T1
D6	8-719-800-76	s	DIODE 1SS226
IC1	8-759-929-21	s	IC TLC27L2CPS
IC2	8-759-058-62	s	IC TC7S08FU(TE85R)
IC3	8-759-073-52	s	IC TC74AC04F-EL
IC4	8-759-979-69	s	IC TSC426C0A

(DR-271(I) Board)

Ref. No. or Q'ty	Part No.	SP	Description
IC5	8-759-906-54	s	IC TL064CNS
IC6	8-759-635-27	s	IC M62352GP
IC7	8-759-175-04	s	IC PCF8574T-T
IC8	8-759-082-60	s	IC TC7S66FU
IC9	8-759-082-60	s	IC TC7S66FU
IC11	8-759-172-33	s	IC UPD16502GS(1)
IC13	8-759-172-33	s	IC UPD16502GS(1)
IC15	8-759-172-33	s	IC UPD16502GS(1)
L1	1-410-737-31	s	INDUCTOR CHIP 0.47uH
Q1	8-729-141-48	s	TRANSISTOR 2SB624-BV345
Q2	8-729-122-63	s	TRANSISTOR 2SA1226
Q3	8-729-421-71	s	TRANSISTOR 2SK620
Q4	8-729-141-48	s	TRANSISTOR 2SB624-BV345
R4	1-218-692-11	s	METAL, CHIP 1K 0.50% 1/16W
R5	1-218-724-11	s	METAL, CHIP 22K 5% 1/16W
R6	1-218-721-11	s	METAL, CHIP 16K 0.50% 1/16W
R7	1-220-242-11	s	METAL, CHIP 22 5% 1/4W
R8	1-218-652-11	s	METAL, CHIP 22 0.50% 1/16W
R9	1-218-728-11	s	METAL, CHIP 33K 0.50% 1/16W
R10	1-218-728-11	s	METAL, CHIP 33K 0.50% 1/16W
R13	1-218-728-11	s	METAL, CHIP 33K 0.50% 1/16W
R14	1-218-728-11	s	METAL, CHIP 33K 0.50% 1/16W
R15	1-218-728-11	s	METAL, CHIP 33K 0.50% 1/16W
R16	1-218-728-11	s	METAL, CHIP 33K 0.50% 1/16W
R19	1-218-644-11	s	METAL, CHIP 10 0.50% 1/16W
R20	1-218-644-11	s	METAL, CHIP 10 0.50% 1/16W
R21	1-218-740-11	s	METAL, CHIP 100K 0.50% 1/16W
R22	1-218-644-11	s	METAL, CHIP 10 0.50% 1/16W
R23	1-218-716-11	s	METAL, CHIP 10K 0.50% 1/16W
R24	1-218-692-11	s	METAL, CHIP 1K 0.50% 1/16W
R25	1-218-668-11	s	METAL, CHIP 100 0.50% 1/16W
R26	1-218-851-11	s	METAL, CHIP 1.5K 0.50% 1/16W
R27	1-218-648-11	s	METAL, CHIP 15 0.50% 1/16W
R28	1-218-648-11	s	METAL, CHIP 15 0.50% 1/16W
R29	1-218-716-11	s	METAL, CHIP 10K 0.50% 1/16W
R30	1-218-711-11	s	METAL, CHIP 6.2K 0.50% 1/16W
R31	1-218-740-11	s	METAL, CHIP 100K 0.50% 1/16W
R32	1-218-751-11	s	METAL, CHIP 300K 0.50% 1/16W
R33	1-218-655-91	s	METAL, CHIP 30 0.50% 1/16W
R34	1-218-668-11	s	METAL, CHIP 100 0.50% 1/16W
R35	1-218-644-11	s	METAL, CHIP 10 0.50% 1/16W
R36	1-218-644-11	s	METAL, CHIP 10 0.50% 1/16W
#R37	1-218-688-11	s	METAL, CHIP 680 0.50% 1/16W
R38	1-218-729-11	s	METAL, CHIP 36K 0.50% 1/16W
R39	1-218-723-11	s	METAL, CHIP 20K 0.50% 1/16W
R40	1-218-732-11	s	METAL, CHIP 47K 0.50% 1/16W
R41	1-218-723-11	s	METAL, CHIP 20K 0.50% 1/16W
R42	1-218-732-11	s	METAL, CHIP 47K 0.50% 1/16W
R43	1-218-723-11	s	METAL, CHIP 20K 0.50% 1/16W
R44	1-218-732-11	s	METAL, CHIP 47K 0.50% 1/16W
R50	1-218-748-11	s	METAL, CHIP 220K 0.50% 1/16W
R51	1-218-748-11	s	METAL, CHIP 220K 0.50% 1/16W
R52	1-218-748-11	s	METAL, CHIP 220K 0.50% 1/16W
R53	1-218-748-11	s	METAL, CHIP 220K 0.50% 1/16W
R54	1-218-724-11	s	METAL, CHIP 22K 5% 1/16W
R55	1-218-724-11	s	METAL, CHIP 22K 5% 1/16W
R56	1-218-724-11	s	METAL, CHIP 22K 5% 1/16W

NOTE : For the parts marked # in the parts list, refer to Section 3-6 “Changed Parts”.

(DR-271(I) Board)

Ref. No. or Q'ty	Part No.	SP	Description
R57	1-218-724-11	s	METAL, CHIP 22K 5% 1/16W
R59	1-218-716-11	s	METAL, CHIP 10K 0.50% 1/16W
R60	1-218-716-11	s	METAL, CHIP 10K 0.50% 1/16W
R61	1-218-701-11	s	METAL, CHIP 2.4K 0.50% 1/16W
R62	1-218-712-11	s	METAL, CHIP 6.8K 0.50% 1/16W
R63	1-218-720-11	s	METAL, CHIP 15K 0.50% 1/16W
R64	1-218-730-11	s	METAL, CHIP 39K 0.50% 1/16W
R65	1-218-701-11	s	METAL, CHIP 2.4K 0.50% 1/16W
R66	1-218-712-11	s	METAL, CHIP 6.8K 0.50% 1/16W
R67	1-218-720-11	s	METAL, CHIP 15K 0.50% 1/16W
R68	1-218-730-11	s	METAL, CHIP 39K 0.50% 1/16W
R69	1-218-668-11	s	METAL, CHIP 100 0.50% 1/16W
R70	1-218-668-11	s	METAL, CHIP 100 0.50% 1/16W
R71	1-218-708-11	s	METAL, CHIP 4.7K 0.50% 1/16W
R72	1-216-864-11	s	METAL, CHIP 0 5% 1/16W
R74	1-216-864-11	s	METAL, CHIP 0 5% 1/16W
R75	1-216-864-11	s	METAL, CHIP 0 5% 1/16W
R76	1-216-864-11	s	METAL, CHIP 0 5% 1/16W
R77	1-216-864-11	s	METAL, CHIP 0 5% 1/16W
R78	1-216-864-11	s	METAL, CHIP 0 5% 1/16W
R79	1-216-864-11	s	METAL, CHIP 0 5% 1/16W
R80	1-216-864-11	s	METAL, CHIP 0 5% 1/16W
R81	1-216-864-11	s	METAL, CHIP 0 5% 1/16W
R90	1-216-864-11	s	METAL, CHIP 0 5% 1/16W
R91	1-216-864-11	s	METAL, CHIP 0 5% 1/16W
R92	1-216-864-11	s	METAL, CHIP 0 5% 1/16W
R93	1-216-864-11	s	METAL, CHIP 0 5% 1/16W
R94	1-216-864-11	s	METAL, CHIP 0 5% 1/16W
R95	1-216-864-11	s	METAL, CHIP 0 5% 1/16W
R97	1-218-668-11	s	METAL, CHIP 100 0.50% 1/16

DR-302 Board For OHB-400/400P/451/451P

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-8269-852-A	o	MOUNTED CIRCUIT BOARD, DR-302
#C1	1-110-398-11	s	TANTALUM, CHIP 15uF 20% 35V
C2	1-164-004-11	s	CERAMIC, CHIP 0.1uF 10% 25V
C3	1-104-919-11	s	TANTALUM, CHIP 10uF 20% 25V
C4	1-164-004-11	s	CERAMIC, CHIP 0.1uF 10% 25V
C6	1-164-489-11	s	CERAMIC, CHIP 0.22uF 10% 16V
C7	1-163-275-11	s	CERAMIC, CHIP 0.001uF 5% 50V
C9	1-164-004-11	s	CERAMIC, CHIP 0.1uF 10% 25V
C10	1-163-231-11	s	CERAMIC, CHIP 15PF 5% 50V
C11	1-163-231-11	s	CERAMIC, CHIP 15PF 5% 50V
#C12	1-104-919-11	s	TANTALUM, CHIP 10uF 20% 25V
#C13	1-135-179-21	s	TANTALUM, CHIP 2.2uF 10% 16V
#C14	1-110-398-11	s	TANTALUM, CHIP 15uF 20% 35V
CN1	1-573-324-31	o	CONNECTOR, BOARD TO BOARD 20P
CN2	1-750-862-21	s	PIN, CONNECTOR (PC BOARD) 5P
D1	8-719-104-34	s	DIODE 1S2835
D2	8-719-104-34	s	DIODE 1S2835
D3	8-719-801-78	s	DIODE 1SS184
D4	8-719-800-76	s	DIODE 1SS226
IC1	8-759-324-04	s	IC HA17431UA-TR
IC2	8-759-530-26	s	IC TC4051BFT(EL, N)
IC3	8-759-928-08	s	IC TLC27M4CNS
IC4	8-759-100-95	s	IC UPC324G2
IC5	8-759-164-83	s	IC AQV202A
L2	1-408-793-21	s	INDUCTOR, CHIP 220uH
L3	1-408-793-21	s	INDUCTOR, CHIP 220uH
Q1	8-729-220-93	s	TRANSISTOR 2SK209-G
Q2	8-729-106-68	s	TRANSISTOR 2SC1615A-GP
Q3	8-729-106-68	s	TRANSISTOR 2SC1615A-GP
Q4	8-729-807-34	s	TRANSISTOR 2SB766A-R-TX
Q5	8-729-106-68	s	TRANSISTOR 2SC1615A-GP
Q6	8-729-807-34	s	TRANSISTOR 2SB766A-R-TX
Q7	8-729-141-75	s	TRANSISTOR 2SD596DV345
#Q8	8-729-421-71	s	TRANSISTOR 2SK620
R1	1-216-295-11	s	CONDUCTOR, CHIP 0
R2	1-216-659-11	s	METAL, CHIP 2.2K 0.5% 1/10W
R3	1-216-683-11	s	METAL, CHIP 22K 0.50% 1/10W
R4	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R5	1-216-682-11	s	METAL, CHIP 20K 0.5% 1/10W
R6	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R7	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R8	1-216-699-11	s	METAL, CHIP 100K 0.50% 1/10W
R9	1-216-699-11	s	METAL, CHIP 100K 0.50% 1/10W
R10	1-216-651-11	s	METAL, CHIP 1K 0.5% 1/10W
R11	1-216-651-11	s	METAL, CHIP 1K 0.5% 1/10W
R12	1-218-766-11	s	METAL, CHIP 390K 0.5% 1/10W
R13	1-218-759-11	s	METAL, CHIP 200K 0.50% 1/10W
R14	1-218-756-11	s	METAL, CHIP 150K 0.50% 1/10W
R15	1-216-695-11	s	METAL, CHIP 68K 0.50% 1/10W
R16	1-218-766-11	s	METAL, CHIP 390K 0.5% 1/10W
R17	1-218-759-11	s	METAL, CHIP 200K 0.50% 1/10W
R18	1-218-756-11	s	METAL, CHIP 150K 0.50% 1/10W
R19	1-216-695-11	s	METAL, CHIP 68K 0.50% 1/10W
R20	1-216-651-11	s	METAL, CHIP 1K 0.5% 1/10W

NOTE : For the parts marked # in the parts list, refer to Section 3-6 “Changed Parts”.

(DR-302 Board)

Ref. No. or Q'ty	Part No.	SP	Description
R21	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R22	1-216-113-00	s	METAL, CHIP 470K 5% 1/10W
R23	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R24	1-216-113-00	s	METAL, CHIP 470K 5% 1/10W
R25	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R26	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R27	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R28	1-216-684-11	s	METAL, CHIP 24K 0.50% 1/10W
R29	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R30	1-216-677-11	s	METAL, CHIP 12K 0.5% 1/10W
R31	1-216-651-11	s	METAL, CHIP 1K 0.5% 1/10W
R32	1-216-651-11	s	METAL, CHIP 1K 0.5% 1/10W
R33	1-216-605-11	s	METAL, CHIP 12 0.50% 1/10W
R34	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R35	1-216-691-11	s	METAL, CHIP 47K 0.50% 1/10W
R36	1-216-691-11	s	METAL, CHIP 47K 0.50% 1/10W
R37	1-218-637-11	s	METAL, CHIP 820 5% 1W
R38	1-218-776-11	s	METAL, CHIP 1M 0.50% 1/10W
R40	1-216-605-11	s	METAL, CHIP 12 0.50% 1/10W
R41	1-216-659-11	s	METAL, CHIP 2.2K 0.5% 1/10W
#R42	1-216-643-11	s	METAL, CHIP 470 0.5% 1/10W
#R43	1-218-762-11	s	METAL, CHIP 270K 0.50% 1/10W
RV1	1-241-833-11	s	RES, ADJ, CERMET 10K
RV2	1-241-833-11	s	RES, ADJ, CERMET 10K
RV3	1-241-830-11	s	RES, ADJ, METAL 2K
RV4	1-241-830-11	s	RES, ADJ, METAL 2K
RV5	1-241-830-11	s	RES, ADJ, METAL 2K
RV6	1-241-830-11	s	RES, ADJ, METAL 2K
S1	1-572-272-11	s	SWITCH, SLIDE

NOTE : For the parts marked # in the parts list, refer to Section 3-6 “Changed Parts”.

DR-306 Board For OHB-405WS/405WSP/500/500P/500WS/500WSP

Ref. No. or Q'ty	Part No.	SP	Description
1pc	9-933-969-01	o	MOUNTED CIRCUIT BOARD, DR-306
C1	1-163-077-00	s	CERAMIC, CHIP 0.1uF 10% 25V
C2	9-936-022-01	s	ELECT 33uF 50V
C3	1-163-077-00	s	CERAMIC, CHIP 0.1uF 10% 25V
C4	1-163-077-00	s	CERAMIC, CHIP 0.1uF 10% 25V
C5	1-163-181-00	s	CERAMIC, CHIP 100PF 5% 50V
C6	1-163-181-00	s	CERAMIC, CHIP 100PF 5% 50V
C8	1-135-138-11	s	TANTALUM, CHIP 10uF 20% 25V
C9	1-163-059-00	s	CERAMIC, CHIP 10000PF 10% 50V
C10	1-163-059-00	s	CERAMIC, CHIP 10000PF 10% 50V
C11	1-163-181-00	s	CERAMIC, CHIP 100PF 5% 50V
C12	1-163-181-00	s	CERAMIC, CHIP 100PF 5% 50V
C14	1-135-138-11	s	TANTALUM, CHIP 10uF 20% 25V
C15	1-163-059-00	s	CERAMIC, CHIP 10000PF 10% 50V
C16	1-163-059-00	s	CERAMIC, CHIP 10000PF 10% 50V
C17	1-163-077-00	s	CERAMIC, CHIP 0.1uF 10% 25V
C18	1-135-164-21	s	TANTALUM, CHIP 22uF 10% 16V
C19	1-163-077-00	s	CERAMIC, CHIP 0.1uF 10% 25V
C20	1-163-077-00	s	CERAMIC, CHIP 0.1uF 10% 25V
C21	1-163-077-00	s	CERAMIC, CHIP 0.1uF 10% 25V
C22	1-135-092-21	s	TANTALUM, CHIP 3.3uF 10% 16V
C23	1-163-077-00	s	CERAMIC, CHIP 0.1uF 10% 25V
C24	1-163-181-00	s	CERAMIC, CHIP 100PF 5% 50V
C25	1-163-059-00	s	CERAMIC, CHIP 10000PF 10% 50V
C26	1-163-059-00	s	CERAMIC, CHIP 10000PF 10% 50V
C27	1-163-181-00	s	CERAMIC, CHIP 100PF 5% 50V
C28	1-163-059-00	s	CERAMIC, CHIP 10000PF 10% 50V
C29	1-163-059-00	s	CERAMIC, CHIP 10000PF 10% 50V
CN1	1-573-324-31	o	CONNECTOR, BOARD TO BOARD 20P
CN2	1-766-259-11	o	PIN, CONNECTOR (PC BOARD) 9P
CN3	1-764-084-11	o	PIN, CONNECTOR (PC BOARD) 8P
D1	8-719-820-41	s	DIODE 1SS302
D2	8-719-027-14	s	DIODE 1SS321(TE85L)
D3	9-936-018-01	s	DIODE HZK5C
D4	9-936-018-01	s	DIODE HZK5C
D5	8-719-820-13	s	DIODE 1SS272
D6	8-719-820-13	s	DIODE 1SS272
DT1	8-729-905-18	s	TRANSISTOR DTC144EU
L1	9-936-019-01	s	INDUCTOR, CHIP 3.9uH
L2	9-936-019-01	s	INDUCTOR, CHIP 3.9uH
L3	9-936-020-01	s	INDUCTOR, CHIP 33uH
L4	9-936-020-01	s	INDUCTOR, CHIP 33uH
L5	9-936-020-01	s	INDUCTOR, CHIP 33uH
L6	9-936-020-01	s	INDUCTOR, CHIP 33uH
R1	1-216-864-00	s	CONDCTOR, CHIP 0
R2	1-216-659-11	s	METAL, CHIP 2.2K 0.5% 1/10W
R3	1-208-799-11	s	METAL, CHIP 5.1K 0.50% 1/10W
R4	1-208-799-11	s	METAL, CHIP 5.1K 0.50% 1/10W
R5	1-216-145-00	s	METAL, CHIP 6.2 1/8W 5%
R6	1-216-811-11	s	METAL, CHIP 150 5% 1/16W
R7	1-216-831-11	s	METAL, CHIP 6.8K 5% 1/16W
R8	1-216-826-11	s	METAL, CHIP 2.7K 5% 1/16W
R9	1-216-830-11	s	METAL, CHIP 5.6K 5% 1/16W
R10	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R11	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W

(DR-306 Board)

Ref. No. or Q'ty	Part No.	SP	Description
R12	1-216-841-11	s	METAL, CHIP 47K 5% 1/16W
R13	1-216-841-11	s	METAL, CHIP 47K 5% 1/16W
R14	1-216-145-00	s	METAL, CHIP 6.2 1/8W 5%
R15	1-216-811-11	s	METAL, CHIP 150 5% 1/16W
R16	1-216-831-11	s	METAL, CHIP 6.8K 5% 1/16W
R17	1-216-826-11	s	METAL, CHIP 2.7K 5% 1/16W
R18	1-216-830-11	s	METAL, CHIP 5.6K 5% 1/16W
R19	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R20	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R21	1-216-841-11	s	METAL, CHIP 47K 5% 1/16W
R22	1-216-841-11	s	METAL, CHIP 47K 5% 1/16W
R23	1-216-841-11	s	METAL, CHIP 47K 5% 1/16W
R24	1-216-841-11	s	METAL, CHIP 47K 5% 1/16W
R25	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R26	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R27	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W
R28	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W
R29	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W
R30	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W
R31	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R32	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R33	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R34	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R35	1-216-841-11	s	METAL, CHIP 47K 5% 1/16W
R36	1-216-841-11	s	METAL, CHIP 47K 5% 1/16W
R37	1-216-687-11	s	METAL, CHIP 33K 0.5% 1/10W
R38	1-216-695-11	s	METAL, CHIP 68K 0.50% 1/10W
R39	1-216-101-00	s	METAL, CHIP 150K 5% 1/10W
R40	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R41	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R42	1-216-841-11	s	METAL, CHIP 47K 5% 1/16W
R43	1-216-841-11	s	METAL, CHIP 47K 5% 1/16W
R44	1-216-687-11	s	METAL, CHIP 33K 0.5% 1/10W
R45	1-216-695-11	s	METAL, CHIP 68K 0.50% 1/10W
R46	1-216-101-00	s	METAL, CHIP 150K 5% 1/10W
R47	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R48	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R49	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R50	1-216-665-11	s	METAL, CHIP 3.9K 0.5% 1/10W
R51	1-216-652-11	s	METAL, CHIP 1.1K 0.5% 1/10W
R52	1-216-835-11	s	METAL, CHIP 15K 5% 1/16W
R53	1-216-835-11	s	METAL, CHIP 15K 5% 1/16W
R54	1-216-841-11	s	METAL, CHIP 47K 5% 1/16W
R55	1-216-841-11	s	METAL, CHIP 47K 5% 1/16W
R56	1-216-841-11	s	METAL, CHIP 47K 5% 1/16W
R57	1-216-841-11	s	METAL, CHIP 47K 5% 1/16W
R58	1-216-841-11	s	METAL, CHIP 47K 5% 1/16W
R59	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R60	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R61	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R62	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R63	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R64	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R65	1-216-841-11	s	METAL, CHIP 47K 5% 1/16W
R66	1-216-841-11	s	METAL, CHIP 47K 5% 1/16W
R67	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R68	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R69	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R70	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W

(DR-306 Board)

Ref. No. or Q'ty	Part No.	SP	Description
R71	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R72	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R101	1-216-829-11	s	METAL, CHIP 4.7K 5% 1/16W
R102	1-216-829-11	s	METAL, CHIP 4.7K 5% 1/16W
SW1	1-571-402-11	s	SWITCH, SLIDE
TR1	8-729-111-13	s	TRANSISTOR 2SA1385-Z-M
TR2	8-729-140-63	s	TRANSISTOR 2SA1611-M5M6
TR3	8-729-117-31	s	TRANSISTOR 2SC4177-L5
TR4	8-729-111-13	s	TRANSISTOR 2SA1385-Z-M
TR5	8-729-140-63	s	TRANSISTOR 2SA1611-M5M6
TR6	8-729-117-31	s	TRANSISTOR 2SC4177-L5
U1	9-936-013-01	o	IC HD647532F-BKDW701
U2	8-759-420-77	s	IC PST574CMT-T1
U3	9-936-016-01	s	IC LMC662CM
U4	8-759-239-25	s	IC TC74HC4066AF
U5	8-759-324-03	s	IC HA17431UA-TL
U6	8-759-324-03	s	IC HA17431UA-TL
U7	8-759-100-94	s	IC UPC358G2
U8	9-936-017-01	s	IC TA8409F
U9	9-936-017-01	s	IC TA8409F
VR1	1-241-671-11	s	RES, ADJ, METAL 5K
VR2	1-241-671-11	s	RES, ADJ, METAL 5K
X1	1-760-479-11	s	VIBRATOR, CERAMIC 8.0 MHz

NOTE : For the parts marked # in the parts list, refer to Section 3-6 “Changed Parts”.

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PA-181 Board Except OHB-405WS/405WSP/455WS/455WSP

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-8269-314-A	o	MOUNTED CIRCUIT BOARD PA-181
2pcs	3-533-310-11	s	CUSHION, CASSETTE LID
C1	1-135-164-21	s	TANTALUM, CHIP 22uF 10% 16V
C2	1-135-159-21	s	TANTALUM, CHIP 10uF 10% 20V
C3	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C4	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C5	1-162-921-11	s	CERAMIC, CHIP 33PF 5% 50V
C6	1-162-917-11	s	CERAMIC, CHIP 15PF 5% 50V
C8	1-135-159-21	s	TANTALUM, CHIP 10uF 10% 20V
C9	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C10	1-162-921-11	s	CERAMIC, CHIP 33PF 5% 50V
C11	1-162-920-11	s	CERAMIC, CHIP 27PF 5% 50V
C12	1-162-908-11	s	CERAMIC, CHIP 3PF 50V
C13	1-107-688-11	s	TANTALUM, CHIP 1.5uF 20% 25V
C14	1-135-164-21	s	TANTALUM, CHIP 22uF 10% 16V
C15	1-135-159-21	s	TANTALUM, CHIP 10uF 10% 20V
C16	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C17	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C18	1-162-921-11	s	CERAMIC, CHIP 33PF 5% 50V
C19	1-162-916-11	s	CERAMIC, CHIP 12PF 5% 50V
C20	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C21	1-135-159-21	s	TANTALUM, CHIP 10uF 10% 20V
C22	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C23	1-162-921-11	s	CERAMIC, CHIP 33PF 5% 50V
C24	1-162-920-11	s	CERAMIC, CHIP 27PF 5% 50V
C25	1-162-908-11	s	CERAMIC, CHIP 3PF 50V
C26	1-135-217-21	s	TANTALUM, CHIP 15uF 20% 6.3V
C27	1-135-164-21	s	TANTALUM, CHIP 22uF 10% 16V
C28	1-135-159-21	s	TANTALUM, CHIP 10uF 10% 20V
C29	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C30	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C31	1-162-921-11	s	CERAMIC, CHIP 33PF 5% 50V
C32	1-162-916-11	s	CERAMIC, CHIP 12PF 5% 50V
C33	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C34	1-135-159-21	s	TANTALUM, CHIP 10uF 10% 20V
C35	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C36	1-162-921-11	s	CERAMIC, CHIP 33PF 5% 50V
C37	1-162-920-11	s	CERAMIC, CHIP 27PF 5% 50V
C38	1-162-908-11	s	CERAMIC, CHIP 3PF 50V
C39	1-135-179-21	s	TANTALUM, CHIP 2.2uF 10% 16V
C40	1-135-214-21	s	TANTALUM, CHIP 4.7uF 20% 20V
C41	1-135-211-11	s	TANTALUM, CHIP 6.8uF 20% 6.3V
C42	1-135-214-21	s	TANTALUM, CHIP 4.7uF 20% 20V
C43	1-135-211-11	s	TANTALUM, CHIP 6.8uF 20% 6.3V
C44	1-135-211-11	s	TANTALUM, CHIP 6.8uF 20% 6.3V
C45	1-135-214-21	s	TANTALUM, CHIP 4.7uF 20% 20V
C46	1-135-211-11	s	TANTALUM, CHIP 6.8uF 20% 6.3V
C47	1-135-214-21	s	TANTALUM, CHIP 4.7uF 20% 20V
C48	1-135-217-21	s	TANTALUM, CHIP 15uF 20% 6.3V
C49	1-135-160-21	s	TANTALUM, CHIP 15uF 10% 16V
C50	1-135-211-11	s	TANTALUM, CHIP 6.8uF 20% 6.3V
C51	1-135-179-21	s	TANTALUM, CHIP 2.2uF 10% 16V
C52	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C53	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C54	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C55	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C56	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C57	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V

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Ref. No. or Q'ty	Part No.	SP	Description
C58	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C59	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C60	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C61	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C62	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C63	1-135-217-21	s	TANTALUM, CHIP 15uF 20% 6.3V
C64	1-135-179-21	s	TANTALUM, CHIP 2.2uF 10% 16V
C65	1-135-217-21	s	TANTALUM, CHIP 15uF 20% 6.3V
#C66	1-162-908-11	s	CERAMIC, CHIP 3PF 0.25PF 50V
#C68	1-162-908-11	s	CERAMIC, CHIP 3PF 0.25PF 50V
CN1	1-764-091-11	o	PIN, CONNECTOR (PC BOARD) 6P
CN2	1-506-467-11	o	CONNECTOR 2P, MALE
CN3	1-506-467-11	o	CONNECTOR 2P, MALE
CN4	1-506-467-11	o	CONNECTOR 2P, MALE
CN5	1-691-942-11	s	CONNECTOR, BOARD TO BOARD 30P
CV1	1-141-368-11	s	CAP, CHIP TRIMMER 30PF
CV2	1-141-368-11	s	CAP, CHIP TRIMMER 30PF
CV3	1-141-368-11	s	CAP, CHIP TRIMMER 30PF
D1	8-719-041-68	s	DIODE RD3.3UH-T1
D2	8-719-041-68	s	DIODE RD3.3UH-T1
D3	8-719-041-68	s	DIODE RD3.3UH-T1
D4	8-719-029-57	s	DIODE RD2.4UH-T1
IC1	8-759-511-14	s	IC TLC274CNS
IC2	8-759-970-59	s	IC TLC272CPS
IC3	8-759-058-62	s	IC TC7S08FU(TE85R)
IC4	8-759-058-62	s	IC TC7S08FU(TE85R)
IC5	8-759-058-62	s	IC TC7S08FU(TE85R)
IC6	8-759-058-62	s	IC TC7S08FU(TE85R)
IC7	8-759-058-62	s	IC TC7S08FU(TE85R)
IC8	8-759-058-62	s	IC TC7S08FU(TE85R)
Q1	8-729-122-63	s	TRANSISTOR 2SA1226
Q2	8-769-401-67	s	TRANSISTOR 3SK163-1
Q3	8-729-802-80	s	TRANSISTOR 2SC3661
Q4	8-729-122-63	s	TRANSISTOR 2SA1226
Q5	8-769-401-67	s	TRANSISTOR 3SK163-1
Q6	8-729-802-80	s	TRANSISTOR 2SC3661
Q7	8-729-122-63	s	TRANSISTOR 2SA1226
Q8	8-729-802-80	s	TRANSISTOR 2SC3661
Q9	8-729-122-63	s	TRANSISTOR 2SA1226
Q10	8-769-401-67	s	TRANSISTOR 3SK163-1
Q11	8-729-802-80	s	TRANSISTOR 2SC3661
Q12	8-729-039-89	s	TRANSISTOR 2SC3082KT146Q
Q13	8-729-039-89	s	TRANSISTOR 2SC3082KT146Q
Q14	8-729-403-32	s	TRANSISTOR XN6534
Q15	8-729-039-89	s	TRANSISTOR 2SC3082KT146Q
Q16	8-729-122-63	s	TRANSISTOR 2SA1226
Q17	8-729-216-22	s	TRANSISTOR 2SA1162
Q18	8-729-122-63	s	TRANSISTOR 2SA1226
Q19	8-769-401-67	s	TRANSISTOR 3SK163-1
Q20	8-729-802-80	s	TRANSISTOR 2SC3661
Q21	8-729-122-63	s	TRANSISTOR 2SA1226
Q22	8-769-401-67	s	TRANSISTOR 3SK163-1
Q23	8-729-802-80	s	TRANSISTOR 2SC3661
Q24	8-729-122-63	s	TRANSISTOR 2SA1226
Q25	8-729-802-80	s	TRANSISTOR 2SC3661
Q26	8-729-122-63	s	TRANSISTOR 2SA1226
Q27	8-769-401-67	s	TRANSISTOR 3SK163-1

NOTE : For the parts marked # in the parts list, refer to Section 3-6 “Changed Parts”.

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Ref. No. or Q'ty	Part No.	SP	Description
Q28	8-729-802-80	s	TRANSISTOR 2SC3661
Q29	8-729-039-89	s	TRANSISTOR 2SC3082KT146Q
Q30	8-729-039-89	s	TRANSISTOR 2SC3082KT146Q
Q31	8-729-403-32	s	TRANSISTOR XN6534
Q32	8-729-039-89	s	TRANSISTOR 2SC3082KT146Q
Q33	8-729-122-63	s	TRANSISTOR 2SA1226
Q34	8-729-216-22	s	TRANSISTOR 2SA1162
Q35	8-729-122-63	s	TRANSISTOR 2SA1226
Q36	8-769-401-67	s	TRANSISTOR 3SK163-1
Q37	8-729-802-80	s	TRANSISTOR 2SC3661
Q38	8-729-122-63	s	TRANSISTOR 2SA1226
Q39	8-769-401-67	s	TRANSISTOR 3SK163-1
Q40	8-729-802-80	s	TRANSISTOR 2SC3661
Q41	8-729-122-63	s	TRANSISTOR 2SA1226
Q42	8-729-802-80	s	TRANSISTOR 2SC3661
Q43	8-729-122-63	s	TRANSISTOR 2SA1226
Q44	8-769-401-67	s	TRANSISTOR 3SK163-1
Q45	8-729-802-80	s	TRANSISTOR 2SC3661
Q46	8-729-039-89	s	TRANSISTOR 2SC3082KT146Q
Q47	8-729-039-89	s	TRANSISTOR 2SC3082KT146Q
Q48	8-729-403-32	s	TRANSISTOR XN6534
Q49	8-729-039-89	s	TRANSISTOR 2SC3082KT146Q
Q50	8-729-122-63	s	TRANSISTOR 2SA1226
Q51	8-729-216-22	s	TRANSISTOR 2SA1162
Q52	8-729-216-22	s	TRANSISTOR 2SA1162
Q53	8-729-216-22	s	TRANSISTOR 2SA1162
R1	1-218-684-11	s	METAL, CHIP 470 0.50% 1/16W
R2	1-218-728-11	s	METAL, CHIP 33K 0.50% 1/16W
R3	1-218-722-11	s	METAL, CHIP 18K 0.50% 1/16W
R4	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R5	1-218-730-11	s	METAL, CHIP 39K 0.50% 1/16W
R6	1-218-742-11	s	METAL, CHIP 120K 0.50% 1/16W
R7	1-218-656-11	s	METAL, CHIP 33 0.50% 1/16W
R8	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R9	1-218-656-11	s	METAL, CHIP 33 0.50% 1/16W
R10	1-218-700-11	s	METAL, CHIP 2.2K 0.50% 1/16W
R11	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R12	1-218-656-11	s	METAL, CHIP 33 0.50% 1/16W
R13	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R14	1-218-672-11	s	METAL, CHIP 150 0.50% 1/16W
R15	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R16	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R17	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R18	1-216-803-11	s	METAL, CHIP 33 5% 1/16W
R20	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R21	1-218-730-11	s	METAL, CHIP 39K 0.50% 1/16W
R22	1-218-742-11	s	METAL, CHIP 120K 0.50% 1/16W
R23	1-218-656-11	s	METAL, CHIP 33 0.50% 1/16W
R24	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R25	1-218-672-11	s	METAL, CHIP 150 0.50% 1/16W
R26	1-218-691-11	s	METAL, CHIP 910 0.50% 1/16W
R27	1-216-853-11	s	METAL, CHIP 470K 5% 1/16W
R28	1-218-752-11	s	METAL, CHIP 330K 0.50% 1/16W
R29	1-218-668-11	s	METAL, CHIP 100 0.50% 1/16W
R30	1-218-672-11	s	METAL, CHIP 150 0.50% 1/16W
R31	1-218-672-11	s	METAL, CHIP 150 0.50% 1/16W
R32	1-218-686-11	s	METAL, CHIP 560 0.50% 1/16W
R33	1-218-699-11	s	METAL, CHIP 2K 0.50% 1/16W

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Ref. No. or Q'ty	Part No.	SP	Description
R34	1-216-829-11	s	METAL, CHIP 4.7K 5% 1/16W
R35	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R36	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R37	1-218-722-11	s	METAL, CHIP 18K 0.50% 1/16W
R38	1-218-716-11	s	METAL, CHIP 10K 0.50% 1/16W
R40	1-218-684-11	s	METAL, CHIP 470 0.50% 1/16W
R41	1-218-728-11	s	METAL, CHIP 33K 0.50% 1/16W
R42	1-218-723-11	s	METAL, CHIP 20K 0.50% 1/16W
R43	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R44	1-218-730-11	s	METAL, CHIP 39K 0.50% 1/16W
R45	1-218-743-11	s	METAL, CHIP 130K 0.50% 1/16W
R46	1-218-656-11	s	METAL, CHIP 33 0.50% 1/16W
R47	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R48	1-218-656-11	s	METAL, CHIP 33 0.50% 1/16W
R49	1-218-700-11	s	METAL, CHIP 2.2K 0.50% 1/16W
R50	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R51	1-218-656-11	s	METAL, CHIP 33 0.50% 1/16W
R52	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R53	1-218-672-11	s	METAL, CHIP 150 0.50% 1/16W
R54	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R55	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R57	1-216-803-11	s	METAL, CHIP 33 5% 1/16W
R58	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R59	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R60	1-218-730-11	s	METAL, CHIP 39K 0.50% 1/16W
R61	1-218-743-11	s	METAL, CHIP 130K 0.50% 1/16W
R62	1-218-656-11	s	METAL, CHIP 33 0.50% 1/16W
R63	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R64	1-218-672-11	s	METAL, CHIP 150 0.50% 1/16W
R65	1-218-691-11	s	METAL, CHIP 910 0.50% 1/16W
R66	1-218-683-11	s	METAL, CHIP 430 0.50% 1/16W
R67	1-216-853-11	s	METAL, CHIP 470K 5% 1/16W
R68	1-218-752-11	s	METAL, CHIP 330K 0.50% 1/16W
#R69	1-218-672-11	s	METAL, CHIP 150 0.50% 1/16W
#R70	1-218-672-11	s	METAL, CHIP 150 0.50% 1/16W
R71	1-218-686-11	s	METAL, CHIP 560 0.50% 1/16W
R72	1-218-699-11	s	METAL, CHIP 2K 0.50% 1/16W
R73	1-216-829-11	s	METAL, CHIP 4.7K 5% 1/16W
R74	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R75	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R76	1-218-722-11	s	METAL, CHIP 18K 0.50% 1/16W
R77	1-218-716-11	s	METAL, CHIP 10K 0.50% 1/16W
R80	1-218-684-11	s	METAL, CHIP 470 0.50% 1/16W
R81	1-218-728-11	s	METAL, CHIP 33K 0.50% 1/16W
R82	1-218-722-11	s	METAL, CHIP 18K 0.50% 1/16W
R83	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R84	1-218-730-11	s	METAL, CHIP 39K 0.50% 1/16W
R85	1-218-742-11	s	METAL, CHIP 120K 0.50% 1/16W
R86	1-218-656-11	s	METAL, CHIP 33 0.50% 1/16W
R87	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R88	1-218-656-11	s	METAL, CHIP 33 0.50% 1/16W
R89	1-218-700-11	s	METAL, CHIP 2.2K 0.50% 1/16W
R90	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R91	1-218-656-11	s	METAL, CHIP 33 0.50% 1/16W
R92	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R93	1-218-672-11	s	METAL, CHIP 150 0.50% 1/16W
R94	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R95	1-216-797-11	s	METAL, CHIP 10 5% 1/16W

NOTE : For the parts marked # in the parts list, refer to Section 3-6 “Changed Parts”.

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Ref. No. or Q'ty	Part No.	SP	Description
R96	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R97	1-216-803-11	s	METAL, CHIP 33 5% 1/16W
R99	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R100	1-218-730-11	s	METAL, CHIP 39K 0.50% 1/16W
R101	1-218-742-11	s	METAL, CHIP 120K 0.50% 1/16W
R102	1-218-656-11	s	METAL, CHIP 33 0.50% 1/16W
R103	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R104	1-218-672-11	s	METAL, CHIP 150 0.50% 1/16W
R105	1-218-691-11	s	METAL, CHIP 910 0.50% 1/16W
R106	1-216-853-11	s	METAL, CHIP 470K 5% 1/16W
R107	1-218-752-11	s	METAL, CHIP 330K 0.50% 1/16W
R108	1-218-676-11	s	METAL, CHIP 220 0.50% 1/16W
#R109	1-218-672-11	s	METAL, CHIP 150 0.50% 1/16W
#R110	1-218-672-11	s	METAL, CHIP 150 0.50% 1/16W
R111	1-218-686-11	s	METAL, CHIP 560 0.50% 1/16W
R112	1-218-699-11	s	METAL, CHIP 2K 0.50% 1/16W
R113	1-216-829-11	s	METAL, CHIP 4.7K 5% 1/16W
R114	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R115	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R116	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R117	1-218-739-11	s	METAL, CHIP 91K 0.5% 1/16W
R118	1-218-717-11	s	METAL, CHIP 11K 0.50% 1/16W
R119	1-218-722-11	s	METAL, CHIP 18K 0.50% 1/16W
R120	1-218-716-11	s	METAL, CHIP 10K 0.50% 1/16W
R122	1-218-716-11	s	METAL, CHIP 10K 0.50% 1/16W
R123	1-218-682-11	s	METAL, CHIP 390 0.50% 1/16W
R124	1-218-716-11	s	METAL, CHIP 10K 0.50% 1/16W
R126	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W
R127	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R129	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R130	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R131	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R132	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R133	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W
R134	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R136	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W
R137	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R138	1-216-791-11	s	METAL, CHIP 3.3 5% 1/16W
R139	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R140	1-216-864-11	s	METAL, CHIP 0 5% 1/16W
R141	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W
R142	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R143	1-216-791-11	s	METAL, CHIP 3.3 5% 1/16W
R144	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W
R145	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R146	1-216-791-11	s	METAL, CHIP 3.3 5% 1/16W
R147	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W
R148	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R149	1-218-738-11	s	METAL, CHIP 82K 0.50% 1/16W
R150	1-218-738-11	s	METAL, CHIP 82K 0.50% 1/16W
R151	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R152	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R153	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R154	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R155	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R156	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R157	1-218-700-11	s	METAL, CHIP 2.2K 0.50% 1/16W

NOTE : For the parts marked # in the parts list, refer to Section 3-6 “Changed Parts”.

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Ref. No. or Q'ty	Part No.	SP	Description
RV1	1-237-033-11	s	RES, ADJ METAL 1K
RV2	1-237-035-11	s	RES, ADJ METAL 5K
RV3	1-237-035-11	s	RES, ADJ METAL 5K
#RV4	1-237-033-11	s	RES, ADJ METAL 1K
RV5	1-237-034-11	s	RES, ADJ METAL 2K
RV6	1-237-034-11	s	RES, ADJ METAL 2K

PA-213 Board For OHB-405WS/405WSP/455WS/455WSP

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-8316-161-A	o	MOUNTED CIRCUIT BOARD, PA-213
C1	1-135-164-21	s	TANTALUM, CHIP 22uF 10% 16V
C2	1-135-159-21	s	TANTALUM, CHIP 10uF 10% 20V
C3	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C4	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C5	1-162-921-11	s	CERAMIC, CHIP 33PF 5% 50V
C6	1-162-917-11	s	CERAMIC, CHIP 15PF 5% 50V
C8	1-135-159-21	s	TANTALUM, CHIP 10uF 10% 20V
C9	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C10	1-162-921-11	s	CERAMIC, CHIP 33PF 5% 50V
C11	1-162-920-11	s	CERAMIC, CHIP 27PF 5% 50V
C12	1-162-908-11	s	CERAMIC, CHIP 3PF 50V
C13	1-107-688-11	s	TANTALUM, CHIP 1.5uF 20% 25V
C14	1-135-164-21	s	TANTALUM, CHIP 22uF 10% 16V
C15	1-135-159-21	s	TANTALUM, CHIP 10uF 10% 20V
C16	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C17	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C18	1-162-921-11	s	CERAMIC, CHIP 33PF 5% 50V
C19	1-162-916-11	s	CERAMIC, CHIP 12PF 5% 50V
C20	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C21	1-135-159-21	s	TANTALUM, CHIP 10uF 10% 20V
C22	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C23	1-162-921-11	s	CERAMIC, CHIP 33PF 5% 50V
C24	1-162-920-11	s	CERAMIC, CHIP 27PF 5% 50V
C25	1-162-908-11	s	CERAMIC, CHIP 3PF 50V
C26	1-135-217-21	s	TANTALUM, CHIP 15uF 20% 6.3V
C27	1-135-164-21	s	TANTALUM, CHIP 22uF 10% 16V
C28	1-135-159-21	s	TANTALUM, CHIP 10uF 10% 20V
C29	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C30	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C31	1-162-921-11	s	CERAMIC, CHIP 33PF 5% 50V
C32	1-162-916-11	s	CERAMIC, CHIP 12PF 5% 50V
C33	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C34	1-135-159-21	s	TANTALUM, CHIP 10uF 10% 20V
C35	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C36	1-162-921-11	s	CERAMIC, CHIP 33PF 5% 50V
C37	1-162-920-11	s	CERAMIC, CHIP 27PF 5% 50V
C38	1-162-908-11	s	CERAMIC, CHIP 3PF 50V
C39	1-135-179-21	s	TANTALUM, CHIP 2.2uF 10% 16V
C40	1-135-214-21	s	TANTALUM, CHIP 4.7uF 20% 20V
C41	1-135-211-11	s	TANTALUM, CHIP 6.8uF 20% 6.3V
C42	1-135-214-21	s	TANTALUM, CHIP 4.7uF 20% 20V
C43	1-135-211-11	s	TANTALUM, CHIP 6.8uF 20% 6.3V
C44	1-135-211-11	s	TANTALUM, CHIP 6.8uF 20% 6.3V
C45	1-135-214-21	s	TANTALUM, CHIP 4.7uF 20% 20V
C46	1-135-211-11	s	TANTALUM, CHIP 6.8uF 20% 6.3V
C47	1-135-214-21	s	TANTALUM, CHIP 4.7uF 20% 20V
C48	1-135-217-21	s	TANTALUM, CHIP 15uF 20% 6.3V
C49	1-135-160-21	s	TANTALUM, CHIP 15uF 10% 16V
C50	1-135-211-11	s	TANTALUM, CHIP 6.8uF 20% 6.3V
C51	1-135-179-21	s	TANTALUM, CHIP 2.2uF 10% 16V
C52	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C53	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C54	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C55	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C56	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C57	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C58	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V

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Ref. No. or Q'ty	Part No.	SP	Description
C59	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C60	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C61	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C62	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C63	1-135-217-21	s	TANTALUM, CHIP 15uF 20% 6.3V
C64	1-135-179-21	s	TANTALUM, CHIP 2.2uF 10% 16V
C65	1-135-217-21	s	TANTALUM, CHIP 15uF 20% 6.3V
#C66	1-162-908-11	s	CERAMIC, CHIP 3PF 0.25PF 50V
C68	1-162-908-11	s	CERAMIC, CHIP 3PF 0.25PF 50V
C90	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C91	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C92	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C93	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C94	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C95	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C103	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C104	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
CN1	1-764-091-11	o	PIN, CONNECTOR (PC BOARD) 6P
CN2	1-506-467-11	o	CONNECTOR 2P, MALE
CN3	1-506-467-11	o	CONNECTOR 2P, MALE
CN4	1-506-467-11	o	CONNECTOR 2P, MALE
CN5	1-691-942-11	s	CONNECTOR, BOARD TO BOARD 30P
CV1	1-141-368-11	s	CAP, CHIP TRIMMER 30PF
CV2	1-141-368-11	s	CAP, CHIP TRIMMER 30PF
CV3	1-141-368-11	s	CAP, CHIP TRIMMER 30PF
D1	8-719-041-68	s	DIODE RD3.3UH-T1
D2	8-719-041-68	s	DIODE RD3.3UH-T1
D3	8-719-041-68	s	DIODE RD3.3UH-T1
D4	8-719-029-57	s	DIODE RD2.4UH-T1
D5	8-719-800-76	s	DIODE 1SS226
D6	8-719-800-76	s	DIODE 1SS226
D7	8-719-800-76	s	DIODE 1SS226
D8	8-719-800-76	s	DIODE 1SS226
D9	8-719-800-76	s	DIODE 1SS226
D10	8-719-800-76	s	DIODE 1SS226
IC1	8-759-511-14	s	IC TLC274CNS
IC2	8-759-970-59	s	IC TLC272CPS
IC3	8-759-058-62	s	IC TC7S08FU(TE85R)
IC4	8-759-058-62	s	IC TC7S08FU(TE85R)
IC5	8-759-058-62	s	IC TC7S08FU(TE85R)
IC6	8-759-058-62	s	IC TC7S08FU(TE85R)
IC7	8-759-058-62	s	IC TC7S08FU(TE85R)
IC8	8-759-058-62	s	IC TC7S08FU(TE85R)
Q1	8-729-122-63	s	TRANSISTOR 2SA1226
Q2	8-769-401-67	s	TRANSISTOR 3SK163-1
Q3	8-729-802-80	s	TRANSISTOR 2SC3661
Q4	8-729-122-63	s	TRANSISTOR 2SA1226
Q5	8-769-401-67	s	TRANSISTOR 3SK163-1
Q6	8-729-802-80	s	TRANSISTOR 2SC3661
Q7	8-729-122-63	s	TRANSISTOR 2SA1226
Q8	8-729-802-80	s	TRANSISTOR 2SC3661
Q9	8-729-122-63	s	TRANSISTOR 2SA1226
Q10	8-769-401-67	s	TRANSISTOR 3SK163-1
Q11	8-729-802-80	s	TRANSISTOR 2SC3661
Q12	8-729-102-08	s	TRANSISTOR 2SC2223-T1F14
Q13	8-729-102-08	s	TRANSISTOR 2SC2223-T1F14
Q14	8-729-403-32	s	TRANSISTOR XN6534

NOTE : For the parts marked # in the parts list, refer to Section 3-6 “Changed Parts”.

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Ref. No. or Q'ty	Part No.	SP	Description
Q15	8-729-102-08	s	TRANSISTOR 2SC2223-T1F14
Q16	8-729-122-63	s	TRANSISTOR 2SA1226
Q17	8-729-216-22	s	TRANSISTOR 2SA1162
Q18	8-729-122-63	s	TRANSISTOR 2SA1226
Q19	8-769-401-67	s	TRANSISTOR 3SK163-1
Q20	8-729-802-80	s	TRANSISTOR 2SC3661
Q21	8-729-122-63	s	TRANSISTOR 2SA1226
Q22	8-769-401-67	s	TRANSISTOR 3SK163-1
Q23	8-729-802-80	s	TRANSISTOR 2SC3661
Q24	8-729-122-63	s	TRANSISTOR 2SA1226
Q25	8-729-802-80	s	TRANSISTOR 2SC3661
Q26	8-729-122-63	s	TRANSISTOR 2SA1226
Q27	8-769-401-67	s	TRANSISTOR 3SK163-1
Q28	8-729-802-80	s	TRANSISTOR 2SC3661
Q29	8-729-102-08	s	TRANSISTOR 2SC2223-T1F14
Q30	8-729-102-08	s	TRANSISTOR 2SC2223-T1F14
Q31	8-729-403-32	s	TRANSISTOR XN6534
Q32	8-729-102-08	s	TRANSISTOR 2SC2223-T1F14
Q33	8-729-122-63	s	TRANSISTOR 2SA1226
Q34	8-729-216-22	s	TRANSISTOR 2SA1162
Q35	8-729-122-63	s	TRANSISTOR 2SA1226
Q36	8-769-401-67	s	TRANSISTOR 3SK163-1
Q37	8-729-802-80	s	TRANSISTOR 2SC3661
Q38	8-729-122-63	s	TRANSISTOR 2SA1226
Q39	8-769-401-67	s	TRANSISTOR 3SK163-1
Q40	8-729-802-80	s	TRANSISTOR 2SC3661
Q41	8-729-122-63	s	TRANSISTOR 2SA1226
Q42	8-729-802-80	s	TRANSISTOR 2SC3661
Q43	8-729-122-63	s	TRANSISTOR 2SA1226
Q44	8-769-401-67	s	TRANSISTOR 3SK163-1
Q45	8-729-802-80	s	TRANSISTOR 2SC3661
Q46	8-729-102-08	s	TRANSISTOR 2SC2223-T1F14
Q47	8-729-102-08	s	TRANSISTOR 2SC2223-T1F14
Q48	8-729-403-32	s	TRANSISTOR XN6534
Q49	8-729-102-08	s	TRANSISTOR 2SC2223-T1F14
Q50	8-729-122-63	s	TRANSISTOR 2SA1226
Q51	8-729-216-22	s	TRANSISTOR 2SA1162
Q52	8-729-216-22	s	TRANSISTOR 2SA1162
Q53	8-729-216-22	s	TRANSISTOR 2SA1162
R1	1-218-684-11	s	METAL, CHIP 470 0.50% 1/16W
R2	1-218-728-11	s	METAL, CHIP 33K 0.50% 1/16W
R3	1-218-722-11	s	METAL, CHIP 18K 0.50% 1/16W
R4	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R5	1-218-734-11	s	METAL, CHIP 56K 5% 1/16W
R6	1-218-733-11	s	METAL, CHIP 51K 0.50% 1/16W
R7	1-218-656-11	s	METAL, CHIP 33 0.50% 1/16W
R8	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R9	1-218-656-11	s	METAL, CHIP 33 0.50% 1/16W
R10	1-218-700-11	s	METAL, CHIP 2.2K 0.50% 1/16W
R11	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R12	1-218-656-11	s	METAL, CHIP 33 0.50% 1/16W
R13	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R14	1-218-672-11	s	METAL, CHIP 150 0.50% 1/16W
R15	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R16	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R17	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R18	1-216-803-11	s	METAL, CHIP 33 5% 1/16W
R20	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R21	1-218-734-11	s	METAL, CHIP 56K 5% 1/16W

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Ref. No. or Q'ty	Part No.	SP	Description
R22	1-218-738-11	s	METAL, CHIP 82K 0.50% 1/16W
R23	1-218-656-11	s	METAL, CHIP 33 0.50% 1/16W
R24	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R25	1-218-672-11	s	METAL, CHIP 150 0.50% 1/16W
R26	1-218-691-11	s	METAL, CHIP 910 0.50% 1/16W
R27	1-216-853-11	s	METAL, CHIP 470K 5% 1/16W
R28	1-218-752-11	s	METAL, CHIP 330K 0.50% 1/16W
R29	1-218-668-11	s	METAL, CHIP 100 0.50% 1/16W
R30	1-218-672-11	s	METAL, CHIP 150 0.50% 1/16W
R31	1-218-672-11	s	METAL, CHIP 150 0.50% 1/16W
R32	1-218-686-11	s	METAL, CHIP 560 0.50% 1/16W
R33	1-218-699-11	s	METAL, CHIP 2K 0.50% 1/16W
R34	1-216-829-11	s	METAL, CHIP 4.7K 5% 1/16W
R35	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R36	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R37	1-218-722-11	s	METAL, CHIP 18K 0.50% 1/16W
R38	1-218-716-11	s	METAL, CHIP 10K 0.50% 1/16W
R40	1-218-684-11	s	METAL, CHIP 470 0.50% 1/16W
R41	1-218-728-11	s	METAL, CHIP 33K 0.50% 1/16W
R42	1-218-723-11	s	METAL, CHIP 20K 0.50% 1/16W
R43	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R44	1-218-734-11	s	METAL, CHIP 56K 5% 1/16W
R45	1-218-733-11	s	METAL, CHIP 51K 0.50% 1/16W
R46	1-218-656-11	s	METAL, CHIP 33 0.50% 1/16W
R47	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R48	1-218-656-11	s	METAL, CHIP 33 0.50% 1/16W
R49	1-218-700-11	s	METAL, CHIP 2.2K 0.50% 1/16W
R50	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R51	1-218-656-11	s	METAL, CHIP 33 0.50% 1/16W
R52	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R53	1-218-672-11	s	METAL, CHIP 150 0.50% 1/16W
R54	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R55	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R57	1-216-803-11	s	METAL, CHIP 33 5% 1/16W
R58	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R59	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R60	1-218-734-11	s	METAL, CHIP 56K 5% 1/16W
R61	1-218-739-11	s	METAL, CHIP 91K 0.5% 1/16W
R62	1-218-656-11	s	METAL, CHIP 33 0.50% 1/16W
R63	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R64	1-218-672-11	s	METAL, CHIP 150 0.50% 1/16W
R65	1-218-691-11	s	METAL, CHIP 910 0.50% 1/16W
R66	1-218-683-11	s	METAL, CHIP 430 0.50% 1/16W
R67	1-216-853-11	s	METAL, CHIP 470K 5% 1/16W
R68	1-218-752-11	s	METAL, CHIP 330K 0.50% 1/16W
#R69	1-218-672-11	s	METAL, CHIP 150 0.50% 1/16W
#R70	1-218-672-11	s	METAL, CHIP 150 0.50% 1/16W
R71	1-218-686-11	s	METAL, CHIP 560 0.50% 1/16W
R72	1-218-699-11	s	METAL, CHIP 2K 0.50% 1/16W
R73	1-216-829-11	s	METAL, CHIP 4.7K 5% 1/16W
R74	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R75	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R76	1-218-722-11	s	METAL, CHIP 18K 0.50% 1/16W
R77	1-218-716-11	s	METAL, CHIP 10K 0.50% 1/16W
R80	1-218-684-11	s	METAL, CHIP 470 0.50% 1/16W
R81	1-218-728-11	s	METAL, CHIP 33K 0.50% 1/16W
R82	1-218-722-11	s	METAL, CHIP 18K 0.50% 1/16W
R83	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W

NOTE : For the parts marked # in the parts list, refer to Section 3-6 “Changed Parts”.

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Ref. No. or Q'ty	Part No.	SP	Description
R84	1-218-734-11	s	METAL, CHIP 56K 5% 1/16W
R85	1-218-733-11	s	METAL, CHIP 51K 0.50% 1/16W
R86	1-218-656-11	s	METAL, CHIP 33 0.50% 1/16W
R87	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R88	1-218-656-11	s	METAL, CHIP 33 0.50% 1/16W
R89	1-218-700-11	s	METAL, CHIP 2.2K 0.50% 1/16W
R90	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R91	1-218-656-11	s	METAL, CHIP 33 0.50% 1/16W
R92	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R93	1-218-672-11	s	METAL, CHIP 150 0.50% 1/16W
R94	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R95	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R96	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R97	1-216-803-11	s	METAL, CHIP 33 5% 1/16W
R99	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R100	1-218-734-11	s	METAL, CHIP 56K 5% 1/16W
R101	1-218-738-11	s	METAL, CHIP 82K 0.50% 1/16W
R102	1-218-656-11	s	METAL, CHIP 33 0.50% 1/16W
R103	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R104	1-218-672-11	s	METAL, CHIP 150 0.50% 1/16W
R105	1-218-691-11	s	METAL, CHIP 910 0.50% 1/16W
R106	1-216-853-11	s	METAL, CHIP 470K 5% 1/16W
R107	1-218-752-11	s	METAL, CHIP 330K 0.50% 1/16W
R108	1-218-676-11	s	METAL, CHIP 220 0.50% 1/16W
#R109	1-218-672-11	s	METAL, CHIP 150 0.50% 1/16W
#R110	1-218-672-11	s	METAL, CHIP 150 0.50% 1/16W
R111	1-218-686-11	s	METAL, CHIP 560 0.50% 1/16W
R112	1-218-699-11	s	METAL, CHIP 2K 0.50% 1/16W
R113	1-216-829-11	s	METAL, CHIP 4.7K 5% 1/16W
R114	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R115	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R116	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R117	1-218-739-11	s	METAL, CHIP 91K 0.5% 1/16W
R118	1-218-717-11	s	METAL, CHIP 11K 0.50% 1/16W
R119	1-218-722-11	s	METAL, CHIP 18K 0.50% 1/16W
R120	1-218-716-11	s	METAL, CHIP 10K 0.50% 1/16W
R122	1-218-716-11	s	METAL, CHIP 10K 0.50% 1/16W
R123	1-218-682-11	s	METAL, CHIP 390 0.50% 1/16W
R124	1-218-716-11	s	METAL, CHIP 10K 0.50% 1/16W
R126	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W
R127	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R129	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R130	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R131	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R132	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R133	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W
R134	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R136	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W
R137	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R138	1-216-791-11	s	METAL, CHIP 3.3 5% 1/16W
R139	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R140	1-216-864-11	s	METAL, CHIP 0 5% 1/16W
R141	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W
R142	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R143	1-216-791-11	s	METAL, CHIP 3.3 5% 1/16W
R144	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W
R145	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R146	1-216-791-11	s	METAL, CHIP 3.3 5% 1/16W

(PA-213 Board)

Ref. No. or Q'ty	Part No.	SP	Description
R147	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W
R148	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R149	1-218-738-11	s	METAL, CHIP 82K 0.50% 1/16W
R150	1-218-738-11	s	METAL, CHIP 82K 0.50% 1/16W
R151	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R152	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R153	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R154	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R155	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R156	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R157	1-218-700-11	s	METAL, CHIP 2.2K 0.50% 1/16W
R170	1-218-740-11	s	METAL, CHIP 100K 0.50% 1/16W
R171	1-218-740-11	s	METAL, CHIP 100K 0.50% 1/16W
R172	1-218-740-11	s	METAL, CHIP 100K 0.50% 1/16W
R173	1-218-740-11	s	METAL, CHIP 100K 0.50% 1/16W
R174	1-218-740-11	s	METAL, CHIP 100K 0.50% 1/16W
R175	1-218-740-11	s	METAL, CHIP 100K 0.50% 1/16W
R186	1-216-864-11	s	METAL, CHIP 0 5% 1/16W
RV1	1-237-033-11	s	RES, ADJ METAL 1K
RV2	1-237-035-11	s	RES, ADJ METAL 5K
RV3	1-237-035-11	s	RES, ADJ METAL 5K
RV4	1-237-032-11	s	RES, ADJ METAL 500
RV5	1-237-034-11	s	RES, ADJ METAL 2K
RV6	1-237-034-11	s	RES, ADJ METAL 2

NOTE : For the parts marked # in the parts list, refer to Section 3-6 “Changed Parts”.

```
------------
PR-212 Board  For OHB-405WS/405WSP/500WS/500WSP
------------  For OHB-455WS/455WSP/550WS/550WSP
 Ref. No.
 or Q'ty  Part No.    SP Description

 1pc      A-8269-296-A o MOUNTED CIRCUIT BOARD, PR-212



------------
TG-159 Board  Except OHB-405WS/405WSP/455WS/455WSP
------------
 Ref. No.
 or Q'ty  Part No.    SP Description

 CN3      1-774-261-11 s CONNECTOR,FFC(ZIF) 24P



------------
TG-195 Board  For OHB-405WS/405WSP/455WS/455WSP
------------
 Ref. No.
 or Q'ty  Part No.    SP Description

 CN3      1-774-261-11 s CONNECTOR,FFC(ZIF) 24P



------
 FRAME
------
 Ref. No.
 or Q'ty  Part No.    SP Description

 CN1F(to PA-181/213 BOARD)
          1-695-212-11 o HOUSING, 6P
          1-695-215-11 o CONTACT, FEMALE AWG26-30
 CN21F(to CAMERA)
          1-764-196-11 o HOUSING, 8P
          1-695-215-11 o CONTACT, FEMALE AWG26-30
```

3-4. Supplied Accessories

```
[FOR OHB-400/400P]

 Ref. No.
 or Q'ty  Part No.    SP Description

 1pc      3-692-192-01 o LABEL (2),FILTER
 4pcs     7-682-561-04 s SCREW +B 4X8
 4pcs     7-688-004-11 s W 4, MIDDLE


[FOR OHB-450/450P/451/451P]

 Ref. No.
 or Q'ty  Part No.    SP Description

 1pc      3-692-192-01 o LABEL (2),FILTER


[FOR OHB-500/500P/550/550P]

 Ref. No.
 or Q'ty  Part No.    SP Description

 1pc      3-182-055-01 o LABEL (1), FILTER


[FOR OHB-405WS/405WSP/500WS/500WSP]
[FOR OHB-455WS/455WSP/550WS/550WSP]

 Ref. No.
 or Q'ty  Part No.    SP Description

 1pc      A-8269-296-A o MOUNTED CIRCUIT BOARD, PR-212
 1pc      3-182-055-01 o LABEL (1), FILTER
 3pcs     7-682-545-04 s SCREW +B 3X4
```

3-5. Optional Fixtures

```
 Part No.    SP Description

 J-6026-100-A o RESOLUTION CHART
 J-6026-130-B o GRAYSCALE CHART
 J-6029-140-B o PATTERN BOX
 J-6395-040-A o EXTENSION BOARD, EX-464
 J-6395-100-A o TOOL ASSY, OHB FIXED
```

NOTE : For the parts marked # in the parts list, refer to Section 3-6 “Changed Parts”.

3-6. Changed Parts

NOTE:The number identified by making with) are
matching with each serial numbers.

01) Serial No.10031 and higher (FOR OHB-400;UC)
01) Serial No.30004 and higher (FOR OHB-400;J)
01) Serial No.40026 and higher (FOR OHB-400P;CE)
01) Serial No.10111 and higher (FOR OHB-450;UC)
01) Serial No.30011 and higher (FOR OHB-450;J)
01) Serial No.40086 and higher (FOR OHB-450P;CE)
01) Serial No.10026 and higher (FOR OHB-451;UC)
01) Serial No.30011 and higher (FOR OHB-451;J)
01) Serial No.40031 and higher (FOR OHB-451P;CE)
01) Serial No.10031 and higher (FOR OHB-500;UC)
01) Serial No.30004 and higher (FOR OHB-500;J)
01) Serial No.40004 and higher (FOR OHB-500P;CE)
01) Serial No.10116 and higher (FOR OHB-550;UC)
01) Serial No.30026 and higher (FOR OHB-550;J)
01) Serial No.40016 and higher (FOR OHB-550P;CE)
01) Serial No.10021 and higher (FOR OHB-500WS;UC)
01) Serial No.30004 and higher (FOR OHB-500WS;J)
01) Serial No.40051 and higher (FOR OHB-500WSP;CE)
01) Serial No.10036 and higher (FOR OHB-550WS;UC)
01) Serial No.30031 and higher (FOR OHB-550WS;J)
01) Serial No.40161 and higher (FOR OHB-550WSP;CE)

02) Serial No.10041 and higher (FOR OHB-400;UC)
02) Serial No.30007 and higher (FOR OHB-400;J)
02) Serial No.40036 and higher (FOR OHB-400P;CE)
02) Serial No.10171 and higher (FOR OHB-450;UC)
02) Serial No.30031 and higher (FOR OHB-450;J)
02) Serial No.40211 and higher (FOR OHB-450P;CE)
02) Serial No.10046 and higher (FOR OHB-451;UC)
02) Serial No.30011 and higher (FOR OHB-451;J)
02) Serial No.40071 and higher (FOR OHB-451P;CE)
02) Serial No.10061 and higher (FOR OHB-500;UC)
02) Serial No.30014 and higher (FOR OHB-500;J)
02) Serial No.40109 and higher (FOR OHB-500P;CE)
02) Serial No.10226 and higher (FOR OHB-550;UC)
02) Serial No.30071 and higher (FOR OHB-550;J)
02) Serial No.40271 and higher (FOR OHB-550P;CE)
02) Serial No.10041 and higher (FOR OHB-500WS;UC)
02) Serial No.30014 and higher (FOR OHB-500WS;J)
02) Serial No.40101 and higher (FOR OHB-500WSP;CE)
02) Serial No.10066 and higher (FOR OHB-550WS;UC)
02) Serial No.30066 and higher (FOR OHB-550WS;J)
02) Serial No.40226 and higher (FOR OHB-550WSP;CE)

03) Serial No.10116 and higher (FOR OHB-400;UC)
03) Serial No.30007 and higher (FOR OHB-400;J)
03) Serial No.40049 and higher (FOR OHB-400P;CE)
03) Serial No.10556 and higher (FOR OHB-450;UC)
03) Serial No.30071 and higher (FOR OHB-450;J)
03) Serial No.40713 and higher (FOR OHB-450P;CE)
03) Serial No.10141 and higher (FOR OHB-451;UC)
03) Serial No.30051 and higher (FOR OHB-451;J)
03) Serial No.40208 and higher (FOR OHB-451P;CE)
03) Serial No.10101 and higher (FOR OHB-500;UC)
03) Serial No.30027 and higher (FOR OHB-500;J)
03) Serial No.40134 and higher (FOR OHB-500P;CE)
03) Serial No.10471 and higher (FOR OHB-550;UC)
03) Serial No.30226 and higher (FOR OHB-550;J)
03) Serial No.40576 and higher (FOR OHB-550P;CE)
03) Serial No.10041 and higher (FOR OHB-405WS;UC)
03) Serial No.30011 and higher (FOR OHB-405WS;J)
03) Serial No.40046 and higher (FOR OHB-405WSP;CE)
03) Serial No.10051 and higher (FOR OHB-455WS;UC)
03) Serial No.30026 and higher (FOR OHB-455WS;J)
03) Serial No.40166 and higher (FOR OHB-455WSP;CE)
03) Serial No.11011 and higher (FOR OHB-500WS;UC)
03) Serial No.30024 and higher (FOR OHB-500WS;J)
03) Serial No.41051 and higher (FOR OHB-500WSP;CE)
03) Serial No.11021 and higher (FOR OHB-550WS;UC)
03) Serial No.31011 and higher (FOR OHB-550WS;J)
03) Serial No.41142 and higher (FOR OHB-550WSP;CE)

04) Serial No.10116 and higher (FOR OHB-400;UC)
04) Serial No.30007 and higher (FOR OHB-400;J)
04) Serial No.40049 and higher (FOR OHB-400P;CE)
04) Serial No.10641 and higher (FOR OHB-450;UC)
04) Serial No.30086 and higher (FOR OHB-450;J)
04) Serial No.40763 and higher (FOR OHB-450P;CE)
04) Serial No.10166 and higher (FOR OHB-451;UC)
04) Serial No.30056 and higher (FOR OHB-451;J)
04) Serial No.40228 and higher (FOR OHB-451P;CE)
04) Serial No.10111 and higher (FOR OHB-500;UC)
04) Serial No.30027 and higher (FOR OHB-500;J)
04) Serial No.40134 and higher (FOR OHB-500P;CE)
04) Serial No.10491 and higher (FOR OHB-550;UC)
04) Serial No.30241 and higher (FOR OHB-550;J)
04) Serial No.40626 and higher (FOR OHB-550P;CE)
04) Serial No.10071 and higher (FOR OHB-405WS;UC)
04) Serial No.30011 and higher (FOR OHB-405WS;J)
04) Serial No.40056 and higher (FOR OHB-405WSP;CE)
04) Serial No.10116 and higher (FOR OHB-455WS;UC)
04) Serial No.30026 and higher (FOR OHB-455WS;J)
04) Serial No.40266 and higher (FOR OHB-455WSP;CE)
04) Serial No.11011 and higher (FOR OHB-500WS;UC)
04) Serial No.30024 and higher (FOR OHB-500WS;J)
04) Serial No.41051 and higher (FOR OHB-500WSP;CE)
04) Serial No.11081 and higher (FOR OHB-550WS;UC)
04) Serial No.31021 and higher (FOR OHB-550WS;J)
04) Serial No.41222 and higher (FOR OHB-550WSP;CE)

05) Serial No.11001 and higher (FOR OHB-500WS;UC)
05) Serial No.31001 and higher (FOR OHB-500WS;J)
05) Serial No.41001 and higher (FOR OHB-500WSP;CE)
05) Serial No.11001 and higher (FOR OHB-550WS;UC)
05) Serial No.31001 and higher (FOR OHB-550WS;J)
05) Serial No.41001 and higher (FOR OHB-550WSP;CE)

CN-1119A BOARD FOR OHB-405WS/405WSP/500WS/500WSP
--- FOR OHB-455WS/455WSP/550WS/550WSP

04) 1pc A-8269-325-A o MOUNTED CIRCUIT BOARD CN-1119 ---> A-8320-804-A o MOUNTED CIRCUIT BOARD CN-1119A
05) 1pc A-8269-325-A o MOUNTED CIRCUIT BOARD CN-1119 ---> A-8320-804-A o MOUNTED CIRCUIT BOARD CN-1119A

DR-271(F) BOARD FOR OHB-500/500P/500WS/500WSP
--- FOR OHB-550/550P/550WS/550WSP

01) R37 1-218-889-11 s METAL, CHIP 56K 0.50% 1/16W ---> 1-218-688-11 s METAL, CHIP 680 0.50% 1/16W

DR-271(I) BOARD FOR OHB-400/400P/405WS/405WSP
--- FOR OHB-450/450/451/451P/455WS/455WSP

01) R37 1-218-889-11 s METAL, CHIP 56K 0.50% 1/16W ---> 1-218-688-11 s METAL, CHIP 680 0.50% 1/16W

DR-302 BOARD FOR OHB-400/400P/451/451P
---

02) C1 1-126-397-11 s ELECT,CHIP 33uF 20% 25V ---> 1-110-398-11 s TANTALUM,CHIP 15uF 20% 35V
02) C12 1-131-353-00 s TANTALUM, CHIP 10uF 20% 35V ---> 1-104-919-11 s TANTALUM,CHIP 10uF 20% 35V
02) C13 NOT IN USE. ---> 1-135-179-11 s TANTALUM,CHIP 2.2uF 20% 16V
02) C14 NOT IN USE. ---> 1-110-398-11 s TANTALUM,CHIP 15uF 20% 35V
02) Q8 NOT IN USE. ---> 8-729-421-91 s TRANSISTOR 2SK620-TX

02) R42 NOT IN USE. ---> 1-208-774-11 s METAL,CHIP 470 0.50% 1/10W
02) R43 NOT IN USE. ---> 1-218-762-11 s METAL,CHIP 270K 0.50% 1/10W

PA-181 BOARD EXCEPT OHB-405WS/405WSP/455WS/455WSP
---

01) C66 NOT IN USE. ---> 1-162-908-11 s CERAMIC, CHIP 3PF 50V
01) C68 NOT IN USE. ---> 1-162-908-11 s CERAMIC, CHIP 3PF 50V
03) R69 1-218-670-11 s METAL, CHIP 120 0.50% 1/16W ---> 1-218-672-11 s METAL, CHIP 150 0.50% 1/16W
03) R70 1-218-670-11 s METAL, CHIP 120 0.50% 1/16W ---> 1-218-672-11 s METAL, CHIP 150 0.50% 1/16W
03) R109 1-218-671-11 s METAL, CHIP 130 0.50% 1/16W ---> 1-218-672-11 s METAL, CHIP 150 0.50% 1/16W

03) R110 1-218-671-11 s METAL, CHIP 130 0.50% 1/16W ---> 1-218-672-11 s METAL, CHIP 150 0.50% 1/16W
04) RV4 1-237-032-11 s RES, ADJ METAL 500 ---> 1-237-033-11 s RES, ADJ METAL 1K

PA-213 BOARD FOR OHB-405WS/405WSP/455WS/455WSP
---

03) C66 NOT IN USE. ---> 1-162-908-11 s CERAMIC, CHIP 3PF 50V
03) R69 1-218-670-11 s METAL, CHIP 120 0.50% 1/16W ---> 1-218-672-11 s METAL, CHIP 150 0.50% 1/16W
03) R70 1-218-670-11 s METAL, CHIP 120 0.50% 1/16W ---> 1-218-672-11 s METAL, CHIP 150 0.50% 1/16W
03) R109 1-218-671-11 s METAL, CHIP 130 0.50% 1/16W ---> 1-218-672-11 s METAL, CHIP 150 0.50% 1/16W
03) R110 1-218-671-11 s METAL, CHIP 130 0.50% 1/16W ---> 1-218-672-11 s METAL, CHIP 150 0.50% 1/16W

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Section 4
Semiconductor Pin Assignments

ここに記載されている半導体は，それぞれの機能を等価的に表したものです。　なお，互換性のない型名を併記していることがありますので，部品を交換するときは，Spare Partsの章を参照してください。
等価回路はＩＣメーカーのデータブックに従いました。

Semiconductors of which functions are equivalent are described here. For parts replacement, refer to the section of Spare Parts in this manual. The circuit diagram of each IC is obtained from the IC data book published by the manufacturer.

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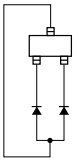
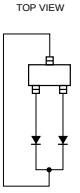
DIODE

TOP VIEW



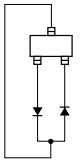
1S2836

TOP VIEW



1SS184

TOP VIEW

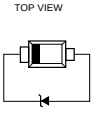


1SS226
HSM107S

TOP VIEW

RD ? ?M-B

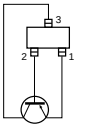
TOP VIEW



RD ? ?UH

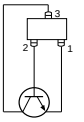
TRANSISTOR

TOP VIEW



2SA1162G
2SA1226
2SA1610
2SB624

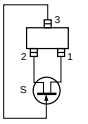
TOP VIEW



2SC1623
2SC2757
2SC3661
2SC4178

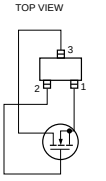
Others

TOP VIEW

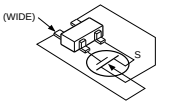


2SK508

TOP VIEW

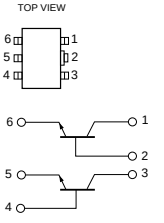


2SK620



3SK163

TOP VIEW



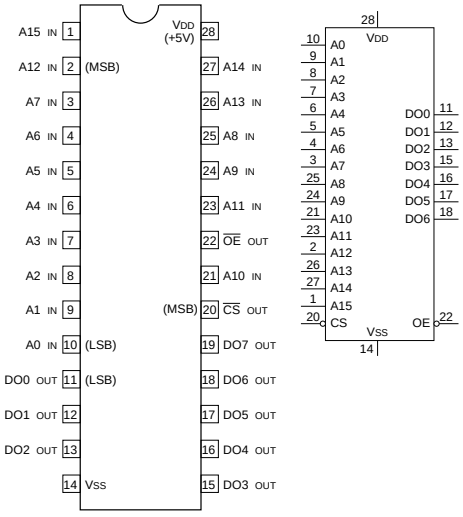
XN6534

IC

AT27C512R-15RC(ATMEL)

C-MOS 512K (65536x8) UV-EPROM

—TOP VIEW—



INPUT		DO	OPERATION
$\overline{CS}$	$\overline{OE}$		
1	X	HIGH-Z	STAND BY
0	1	HIGH-Z	OPERATING
0	0	DO	OPERATING

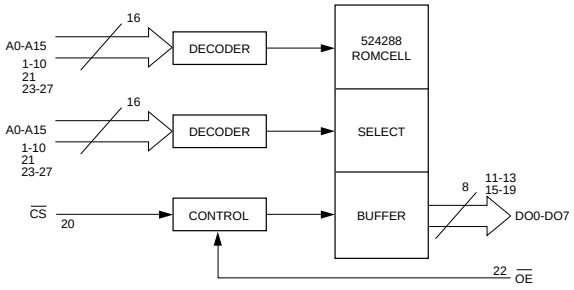
0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; LOW OR HIGH LEVEL

INPUT

A0-A15 ; ADDRESS INPUT
$\overline{CS}$; CHIP SELECT

OUTPUT

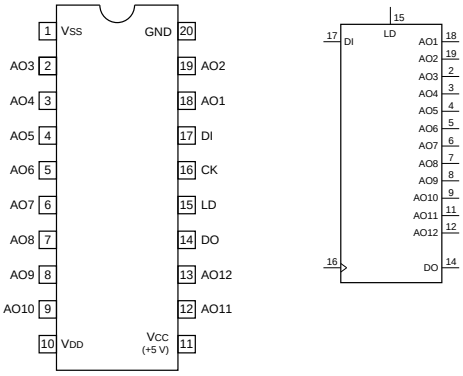
DO0-DO7 ; DATA OUTPUT
$\overline{OE}$; OUTPUT ENABLE



M62352GP(MITSUBISHI)FLAT PACKAGE

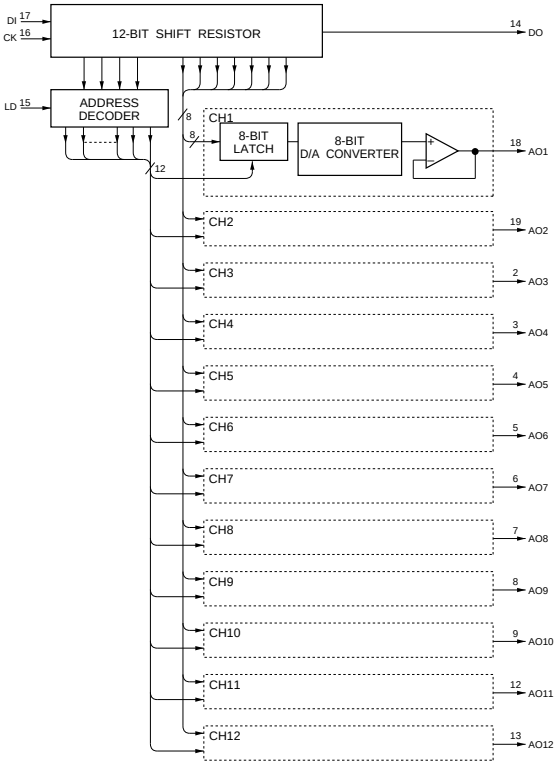
C-MOS 8-BITx12 CHANNEL D/A CONVERTER
(WITH BUFFER OPERATIONAL AMPLIFIER)

— TOP VIEW —



AO1-AO12 ; 8-BIT D/A OUTPUT
CK ; CLOCK INPUT
DI ; SERIAL DATA INPUT
DO ; DATA OUTPUT

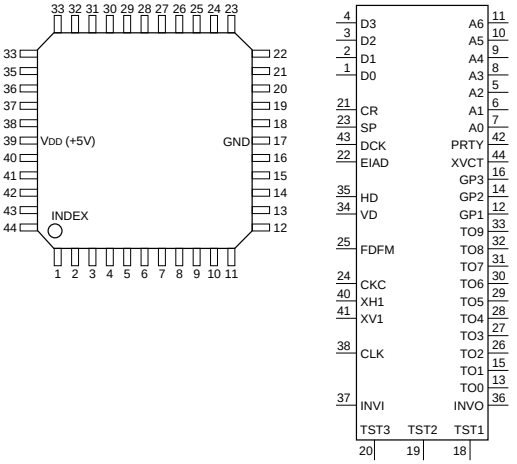
NOTE:
3.5 V < VDD < VCC
–3.5 V < VSS < VCC



CXD8095Q(SONY)FLAT PACKAGE

C-MOS GATE ARRAY

—TOP VIEW—



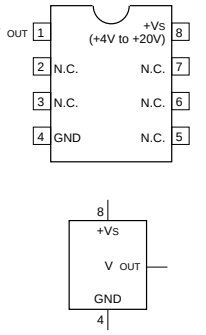
(VDD = +5V)

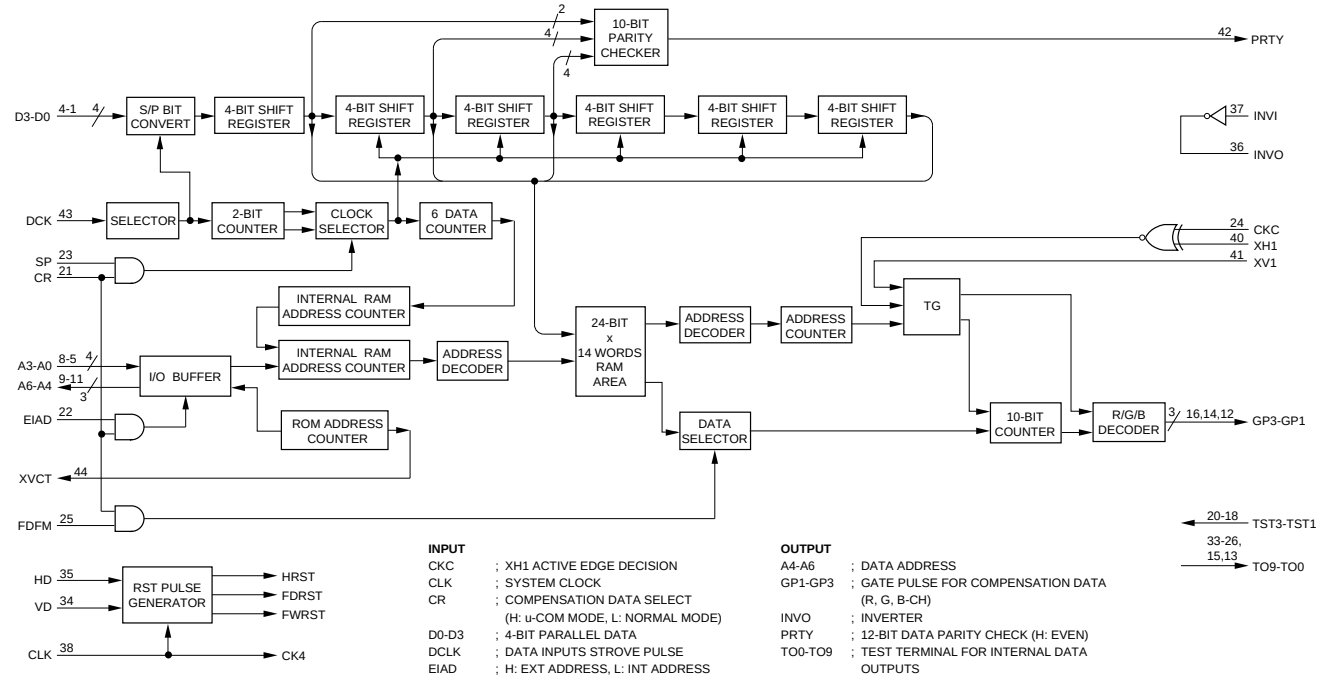
PIN No.	I/O	SYMBOL	PIN No.	I/O	SYMBOL	PIN No.	I/O	SYMBOL	PIN No.	I/O	SYMBOL
1	I	D0	12	O	GP1	23	I	SP	34	I	VD
2	I	D1	13	O	TO0	24	I	CKC	35	I	HD
3	I	D2	14	O	GP2	25	I	FDFM	36	O	INVO
4	I	D3	15	O	TO1	26	O	TO2	37	I	INVI
5	I/O	A2	16	O	GP3	27	O	TO3	38	I	CLK
6	I/O	A1	17	—	GND	28	O	TO4	39	—	VDD
7	I/O	A0	18	I	TST1	29	O	TO5	40	I	XH1
8	I/O	A3	19	I	TST2	30	O	TO6	41	I	XV1
9	O	A4	20	I	TST3	31	O	TO7	42	O	PRTY
10	O	A5	21	I	CR	32	O	TO8	43	I	DCK
11	O	A6	22	I	EIAD	33	O	TO9	44	O	XVCT

LM35DM(NSC)FLAT PACKAGE

TEMPERATURE SENSOR

—TOP VIEW—





INPUT

CKC	;	XH1 ACTIVE EDGE DECISION
CLK	;	SYSTEM CLOCK
CR	;	COMPENSATION DATA SELECT (H: u-COM MODE, L: NORMAL MODE)
D0-D3	;	4-BIT PARALLEL DATA
DCLK	;	DATA INPUTS STROVE PULSE
EIAD	;	H: EXT ADDRESS, L: INT ADDRESS
FDFM	;	FRAME READ/FIELD READ SWITCH (H: FIELD READ)
HD	;	HORIZONTAL DRIVE
INVI	;	INVERTER
SP	;	INPUT DATA SERIAL/PARALLEL SWITCH (H: SERIAL)
TST1-TST3	;	TEST MODE SELECT
VD	;	VERTICAL DRIVE
XH1	;	CLOCK FOR COMPENSATION DATA
XV1	;	LINE COUNTER INPUT TERMINAL

OUTPUT

A4-A6	;	DATA ADDRESS
GP1-GP3	;	GATE PULSE FOR COMPENSATION DATA (R, G, B-CH)
INVO	;	INVERTER
PRTY	;	12-BIT DATA PARITY CHECK (H: EVEN)
TO0-TO9	;	TEST TERMINAL FOR INTERNAL DATA OUTPUTS
XVCT	;	ROM POWER VOLTAGE CONTROL TERMINAL

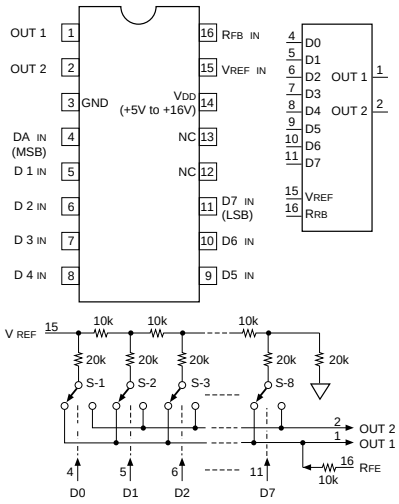
INPUT/OUTPUT

A0-A3	;	DATA ADDRESS OUTPUTS (DATA ADDRESS INPUTS;u-COM MODE)

MP7523JS(MICRO POWER SYSTEMS)FLAT PACKAGE

C-MOS 8-BIT D/A CONVERTER

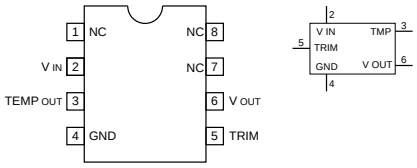
—TOP VIEW—



REF-03GS(PMI)

REFERENCE/TEMPERATURE TRANSDUCER

— TOP VIEW —

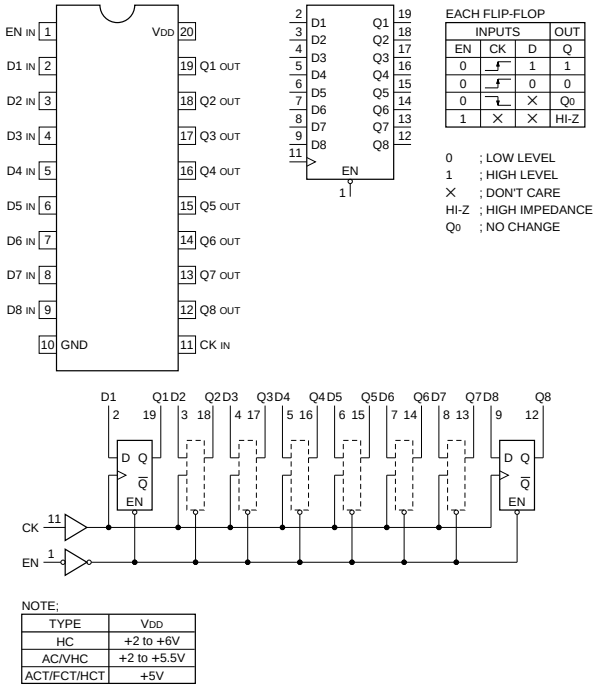


V IN ; INPUT VOLTAGE (+4.5 V to +33 V)
TEMP OUT ; TEMPERATURE TRANSDUCER VOLTAGE OUTPUT
TRIM IN ; OUTPUT SIGNAL TRIMMING
V OUT ; OUTPUT VOLTAGE (+2.5 V)

SN74HC574APW-E20(TI)

C-MOS 3-STATE D-TYPE EDGE-TRIGGERED FLIP-FLOP

—TOP VIEW—



EACH FLIP-FLOP

INPUTS			OUT
EN	CK	D	Q
0	↑	1	1
0	↑	0	0
0	↓	×	Q0
1	×	×	HI-Z

0 ; LOW LEVEL
1 ; HIGH LEVEL
× ; DON'T CARE
HI-Z ; HIGH IMPEDANCE
Q0 ; NO CHANGE

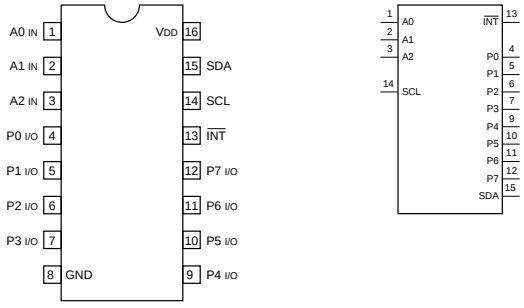
NOTE;

TYPE	VDD
HC	+2 to +6V
AC/VHC	+2 to +5.5V
ACT/FCT/HCT	+5V

PCF8574T(PHILIPS)

C-MOS REMOTE 8-BIT I/O EXPANDER

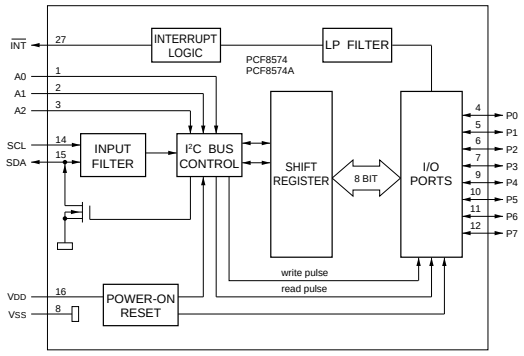
— TOP VIEW —



INPUT
A0 - A2 ; ADDRESS INPUT
SCL ; SYSTEM CLOCK LINE

OUTPUT
$\overline{INT}$; INTERRUPT OUTPUT
SDA ; SERIAL DATA LINE

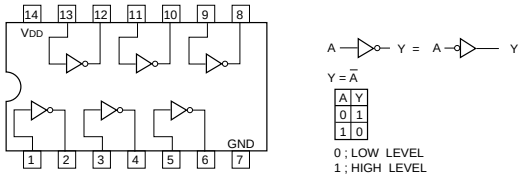
INPUT/OUTPUT
P0 - P7 ; 8-BITS QUASI-BIDIRECTIONAL I/O PORT



TC74AC04F(TOSHIBA)FLAT PACKAGE

C-MOS HEX INVERTERS

—TOP VIEW—



A	Y
0	1
1	0

0 ; LOW LEVEL
1 ; HIGH LEVEL

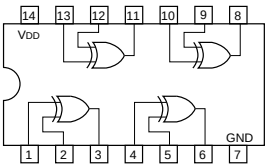
NOTE:

TYPE	VDD
74HCT04 TYPE	+5V
TC74AC04 TYPE TC74VHC04 TYPE	+2 to +5.5V
74ACT04 TYPE	+4.5 to +5.5V
OTHER TYPES	+2 to +6V

TC74AC86F(TOSHIBA)FLAT PACKAGE

C-MOS QUAD EXCLUSIVE OR GATES

—TOP VIEW—



$Y = \overline{A} \cdot B + A \cdot \overline{B}$

A	B	Y
0	0	0
0	1	1
1	0	1
1	1	0

0 ; LOW LEVEL
1 ; HIGH LEVEL

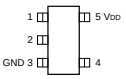
NOTE :

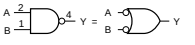
TYPE	VDD
TC74AC/VHC	+2V to +5.5V
TC74HCT	+5V
OTHER TYPES	+2V to +6V

TC7S00F(TOSHIBA)CHIP PACKAGE
TC7S00FU(TOSHIBA)CHIP PACKAGE

C-MOS 2-INPUT NAND GATE

— TOP VIEW —





$Y = \overline{A \cdot B} = \overline{A} + \overline{B}$

A	B	Y
0	0	1
0	1	1
1	0	1
1	1	0

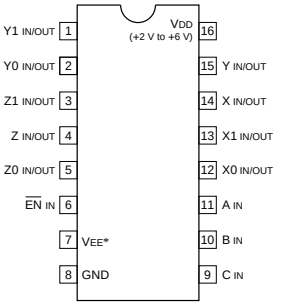
0 ; LOW LEVEL
1 ; HIGH LEVEL

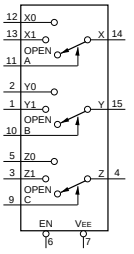
TYPE	VDD
7S00F 7S00FU	+2 to +6 V
4S11F 4SU11F	+3 to +18 V
7SH00FU	+2 to +5.5 V

TC74HC4053AFS(TOSHIBA)FLAT PACKAGE

C-MOS TRIPLE 2-CHANNEL ANALOG MULTIPLEXER/DEMULTIPLEXER

—TOP VIEW—





VEE* ; VDD – VEE = +3 V to +12 V
VEE ≦ GND

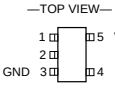
CONTROL INPUTS						
EN	SELECT			ON CHANNEL		
	C	B	A			
0	0	0	0	Z0	Y0	Z0
0	0	0	1	Z0	Y0	Z1
0	0	1	0	Z0	Y1	Z0
0	0	1	1	Z0	Y1	Z1
0	1	0	0	Z1	Y0	Z0
0	1	0	1	Z1	Y0	Z1
0	1	1	0	Z1	Y1	Z0
0	1	1	1	Z1	Y1	Z1
1	X	X	X	OPEN		

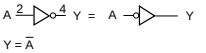
0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE

TC7S04FU(TOSHIBA)CHIP PACKAGE
TC7SH04FU(TOSHIBA)CHIP PACKAGE

C-MOS INVERTER

—TOP VIEW—





$Y = \overline{A}$

A	Y
0	1
1	0

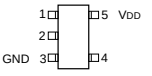
0 ; LOW LEVEL
1 ; HIGH LEVEL

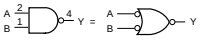
TYPE	VDD
7S04F 7SU04F	+2 to +6V
4S69F 4SU69F	+3 to +18V
7SH04FU	+2 to +5.5V

TC7S08FU(TOSHIBA)CHIP PACKAGE

C-MOS 2-INPUT AND GATE

—TOP VIEW—





$Y = A \cdot B = \overline{\overline{A} + \overline{B}}$

A	B	Y
0	0	0
0	1	0
1	0	0
1	1	1

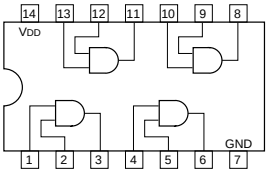
0 ; LOW LEVEL
1 ; HIGH LEVEL

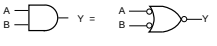
TYPE	VDD
7S08F 7S08FU	+2 to +6V
4S81F 14S81F	+3 to +18V
7SH08FU	–2 to +5.5V

TC74VHC08FS(EL)(TOSHIBA)FLAT PACKAGE(SMALL)

C-MOS QUAD 2-INPUT AND GATES

—TOP VIEW—





$Y = A \cdot B = \overline{\overline{A} + \overline{B}}$

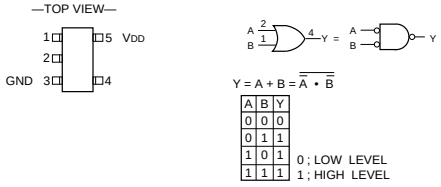
A	B	Y
0	0	0
0	1	0
1	0	0
1	1	1

0 ; LOW LEVEL
1 ; HIGH LEVEL

NOTE:

TYPE	VDD
TC74AC08 TYPE MC74ACT08M	+2 to +5.5V
TC40H	+2 to +8V
OTHER TYPES	+2 to +6V

TC7S32FU(TOSHIBA)CHIP PACKAGE
C-MOS 2-INPUT OR GATE

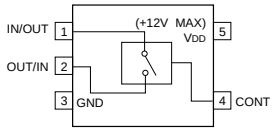


A	B	Y
0	0	0
0	1	1
1	0	1
1	1	1

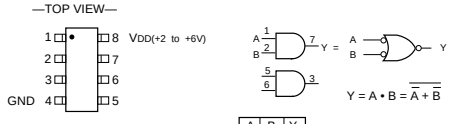
0 ; LOW LEVEL
1 ; HIGH LEVEL

TYPE	VDD
7S32F 7S32FU	+2 to +6V
4S71F	+3 to +18V
7SH32FU	–2 to +5.5V

TC7S66FU(TOSHIBA)
C-MOS ANALOG SWITCH
—TOP VIEW—



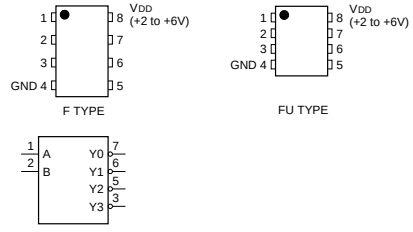
TC7W08FU(TOSHIBA)CHIP PACKAGE
C-MOS 2-INPUT AND GATE



A	B	Y
0	0	0
0	1	0
1	0	0
1	1	1

0 ; LOW LEVEL
1 ; HIGH LEVEL

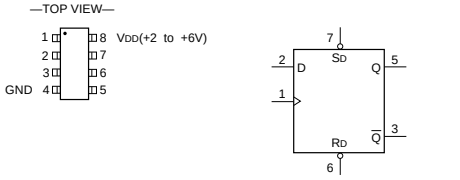
TC7W139FU(TOSHIBA)CHIP PACKAGE
C-MOS 2 to 4 LINE DECODER WITH ENABLE
- TOP VIEW -



INPUTS		OUTPUTS				SELECTED OUTPUT
SELECT						
B	A	$\overline{Y0}$	$\overline{Y1}$	$\overline{Y2}$	$\overline{Y3}$	
0	0	0	1	1	1	$\overline{Y0}$
0	1	1	0	1	1	$\overline{Y1}$
1	0	1	1	0	1	$\overline{Y2}$
1	1	1	1	1	0	$\overline{Y3}$

0 ; LOW LEVL
1 ; HIGH LEVEL

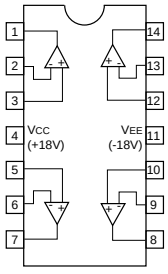
TC7W74FU(TOSHIBA)CHIP PACKAGE
C-MOS D-TYPE FLIP-FLOPS WITH DIRECT SET/RESET



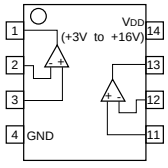
INPUTS				OUTPUTS	
$\overline{SD}$	$\overline{RD}$	CK	D	Qn+1	$\overline{Qn+1}$
0	1	X	X	1	0
1	0	X	X	0	1
0	0	X	X	1	1
1	1	↑	1	1	0
1	1	↑	0	0	1
1	1	↓	X	Qn	$\overline{Qn}$

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE

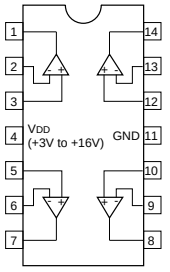
TL064CNS(TI)FLAT PACKAGE
OPERATIONAL AMPLIFIER
(J FET INPUT)
—TOP VIEW—



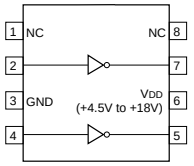
TLC272CPS(TI)FLAT PACKAGE
TLC27L2CPS(TI)FLAT PACKAGE
OPERATIONAL AMPLIFIER
—TOP VIEW—



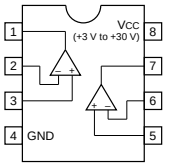
TLC274CNS(TI)FLAT PACKAGE
C-MOS OPERATIONAL AMPLIFIER
—TOP VIEW—



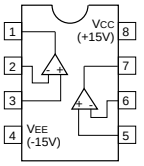
TSC426COA(TELEDYNE)FLAT PACKAGE
C-MOS HIGH SPEED DUAL DRIVER
—TOP VIEW—



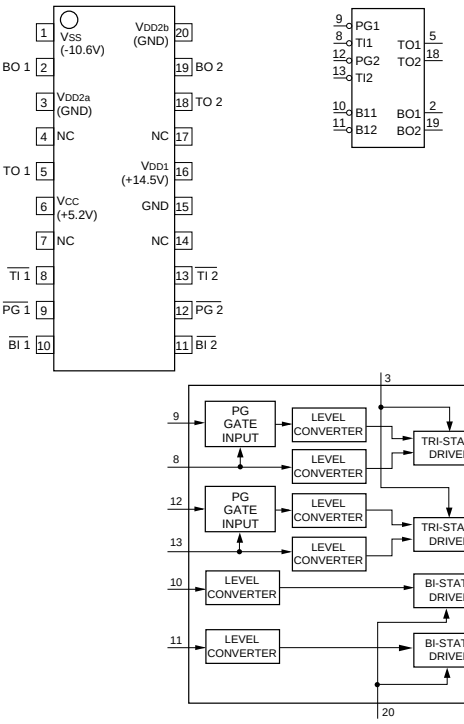
UPC358G2(NEC)FLAT PACKAGE
DUAL OPERATIONAL AMPLIFIERS
— TOP VIEW —



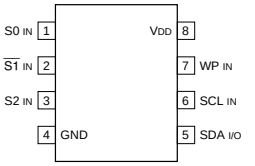
UPC4572G2(NEC)FLAT PACKAGE
OPERATIONAL AMPLIFIER (WIDE BAND, LOW NOISE)
—TOP VIEW—



UPD16502GS(1)(NEC)FLAT PACKAGE
C-MOS CCD DRIVER
—TOP VIEW—



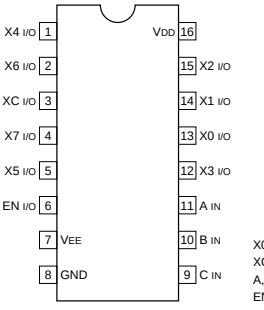
X24164SI(XICOR)(16K BIT)FLAT PACKAGE
C-MOS SERIAL EEPROM
—TOP VIEW—



INPUT
S0, S1, S2 : DEVICE SELECT
SCL : SERIAL CLOCK
WP : WRITE PROTECT

INPUT/OUTPUT
SDA : SERIAL DATA

TC4051BFS(EL)(TOSHIBA)
TC4051BFT(EL, N)(TOSHIBA)
C-MOS 8-CHANNEL ANALOG MULTIPLEXER/DEMULTIPLEXER
—TOP VIEW—



CONTROL INPUTS				SELECTED CHANNEL
EN	SELECT			
	C	B	A	
0	0	0	0	X0
0	0	0	1	X1
0	0	1	0	X2
0	0	1	1	X3
0	1	0	0	X4
0	1	0	1	X5
0	1	1	0	X6
0	1	1	1	X7
1	×	×	×	OPEN

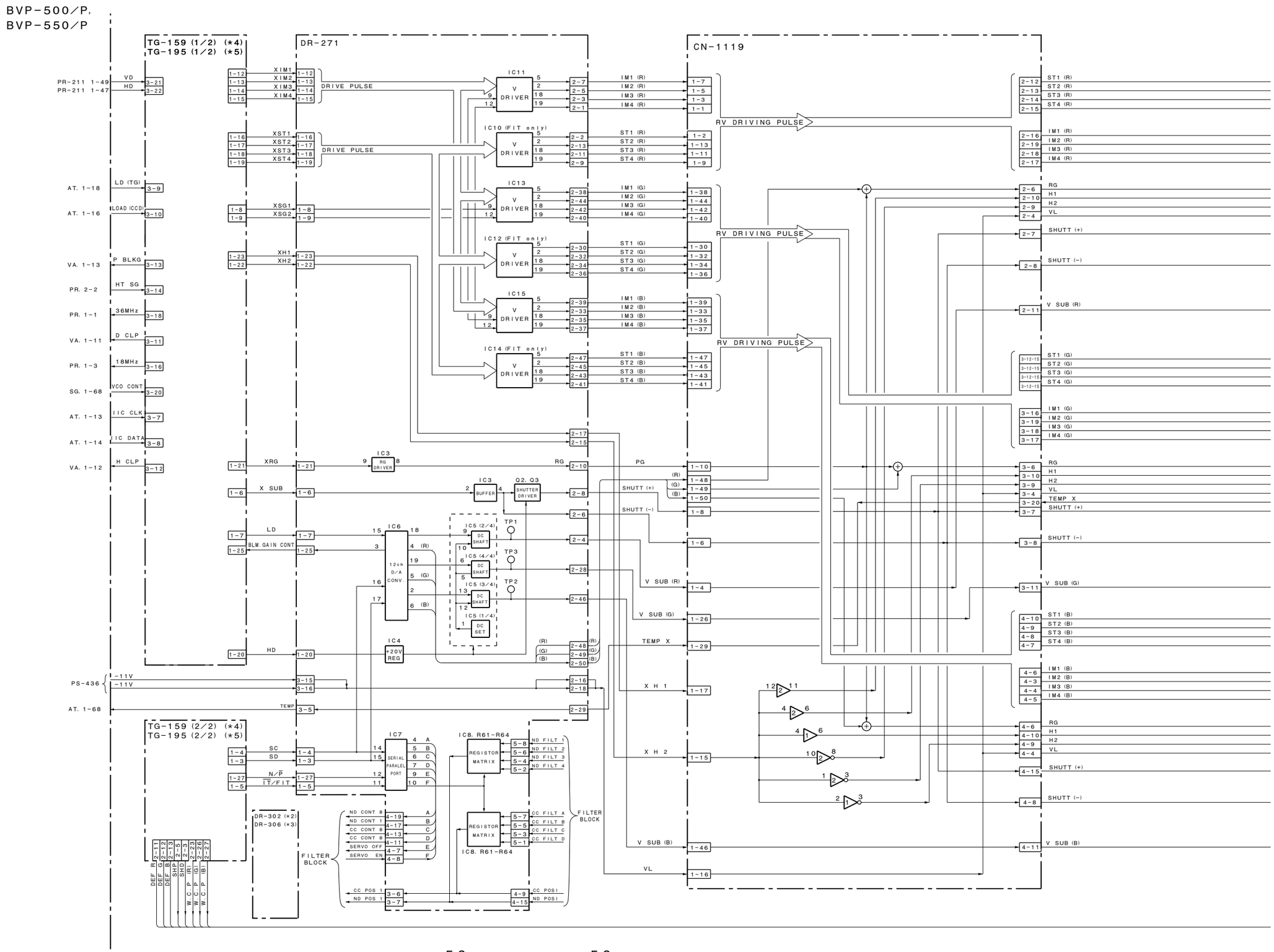
0 : LOW LEVEL
1 : HIGH LEVEL
× : DON'T CARE

X0 to X7 : ANALOG INPUTS/OUTPUTS
XC : COMMON INPUT/OUTPUT
A, B, C : CHANNEL SELECT INPUT
EN : ENABLE INPUT

Section 5
Block Diagram

5-1

CCD Block


BVP-500/P,
BVP-550/P
TG-159 (1/2) (*4)
TG-195 (1/2) (*5)
DR-271
CN-1119
PR-211 1-49
PR-211 1-47
VD
HD
AT. 1-18
LD (TG)
AT. 1-16
LOAD (CCD)
VA. 1-13
P BLKG
PR. 2-2
HT SG
PR. 1-1
36MHz
VA. 1-11
D CLP
PR. 1-3
18MHz
SG. 1-68
VCO CONT
AT. 1-13
IIC CLK
AT. 1-14
IIC DATA
VA. 1-12
H CLP
XIM1
XIM2
XIM3
XIM4
DRIVE PULSE
XST1
XST2
XST3
XST4
XSG1
XSG2
XH1
XH2
XRG
X SUB
LD
BLM.GAIN CONT
HD
PS-436
-11V
-11V
AT. 1-68
TEMP
IC11
IC10 (FIT only)
IC13
IC12 (FIT only)
IC15
IC14 (FIT only)
V DRIVER
IM1 (R)
IM2 (R)
IM3 (R)
IM4 (R)
ST1 (R)
ST2 (R)
ST3 (R)
ST4 (R)
IM1 (G)
IM2 (G)
IM3 (G)
IM4 (G)
ST1 (G)
ST2 (G)
ST3 (G)
ST4 (G)
IM1 (B)
IM2 (B)
IM3 (B)
IM4 (B)
ST1 (B)
ST2 (B)
ST3 (B)
ST4 (B)
RV DRIVING PULSE
IC3
RG DRIVER
BUFFER
Q2, Q3
SHUTTER DRIVER
IC6
12ch D/A CONV.
IC5 (2/4)
IC5 (4/4)
IC5 (3/4)
IC5 (1/4)
DC SHAFT
DC SET
TP1
TP2
TP3
IC4
+20V REG
IC7
SERIAL PARALEL PORT
SC
SD
N/P
IT/FIT
IC8, R61-R64
REGISTOR MATRIX
ND FILT 1
ND FILT 2
ND FILT 3
ND FILT 4
CC FILT A
CC FILT B
CC FILT C
CC FILT D
FILTER BLOCK
ND CONT 8
ND CONT 1
CC CONT 8
CC CONT 8
SERVO OFF
SERVO EN
CC POS 1
ND POS 1
CC POSI
ND POSI
DR-302 (*2)
DR-306 (*3)
DEF R
DEF G
DEF B
SHP
SHD
W.C.P (R)
W.C.P (G)
W.C.P (B)
PG
SHUTT (+)
SHUTT (-)
V SUB (R)
V SUB (G)
TEMP X
X H 1
X H 2
V SUB (B)
VL
RG
H1
H2
VL
SHUTT (+)
SHUTT (-)
V SUB (R)
V SUB (G)
V SUB (B)
TG-159 (2/2) (*4)
TG-195 (2/2) (*5)

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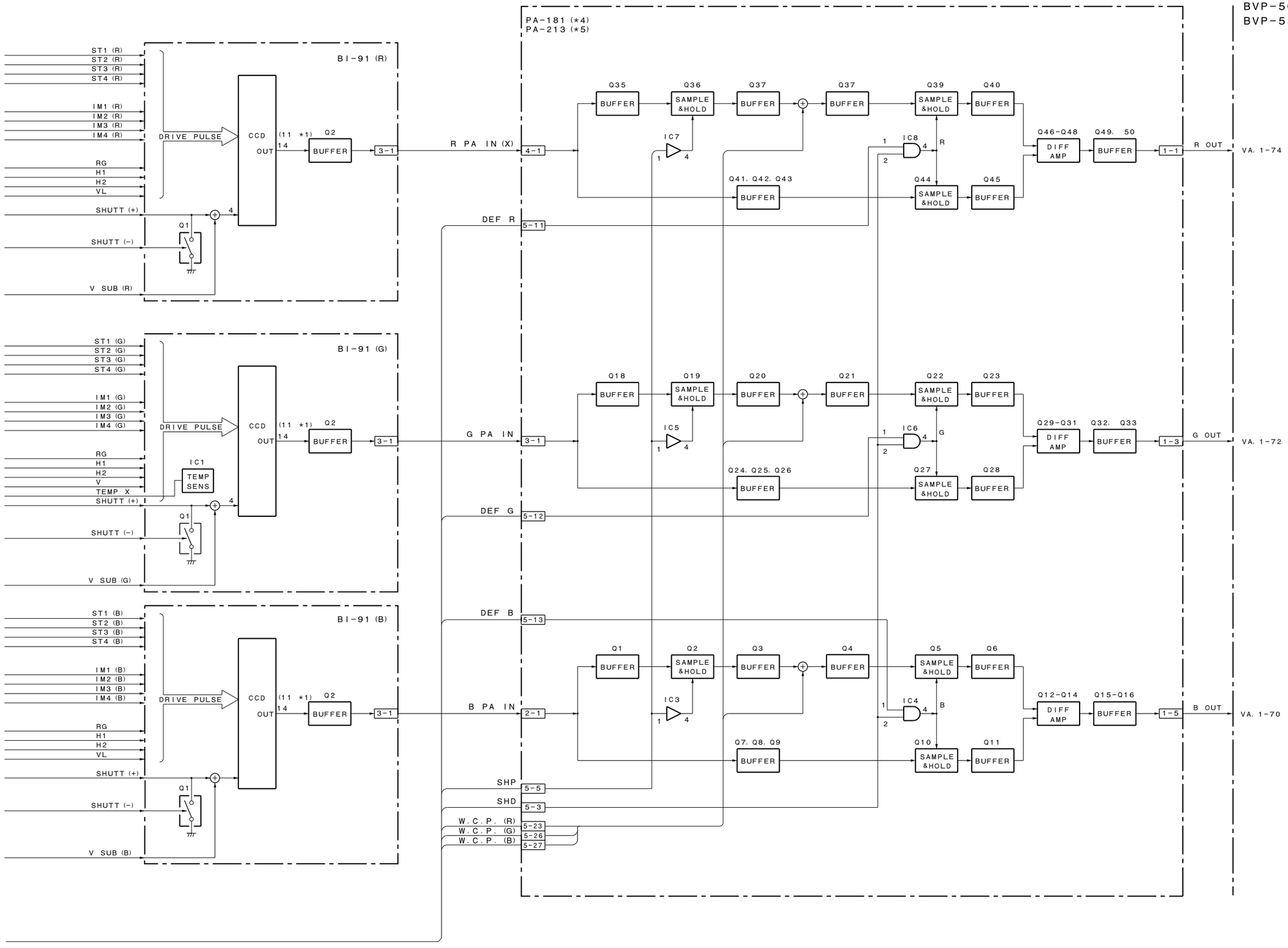


*1 for	OHB-400/400P
	OHB-450/450P
	OHB-451/451P
	OHB-405WS/405WSP
	OHB-455WS/455WSP
	BVP-550WSPK
*2 for	OHB-400/400P
	OHB-451/451P
*3 for	OHB-500/500P
	OHB-500WS/500WSP
	OHB-405WS/405WSP
*4 except	OHB-405WS/405WSP
	OHB-455WS/455WSP
	BVP-550WSPK
*5 for	OHB-405WS/405WSP
	OHB-455WS/455WSP
	BVP-550WSPK

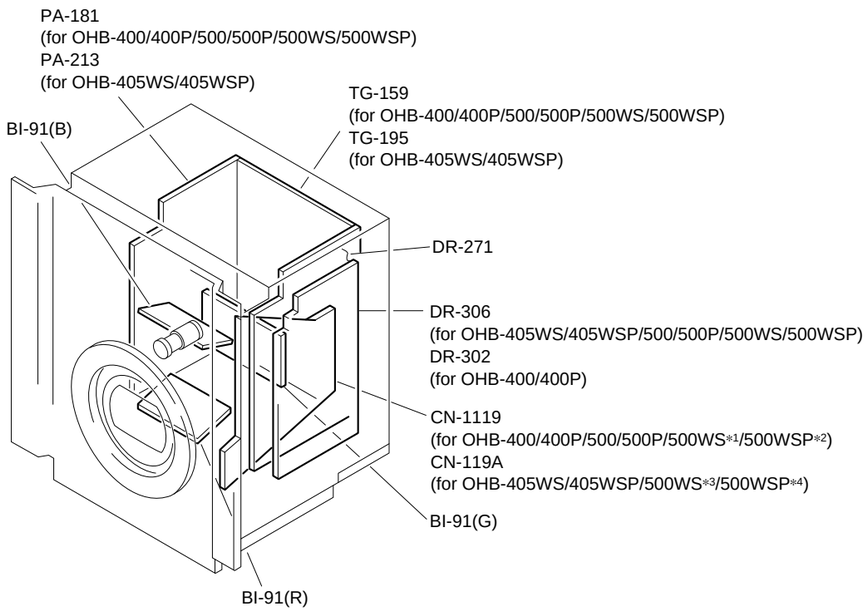
CCD Block
TG-159/195 Board
DR-271 Board
CN-1119 Board
BI-91(R/G/B) Board
DR-302 Board
DR-306 Board

OHB550-CCDBLOCK#1/M

Section 6
Schematic Diagrams

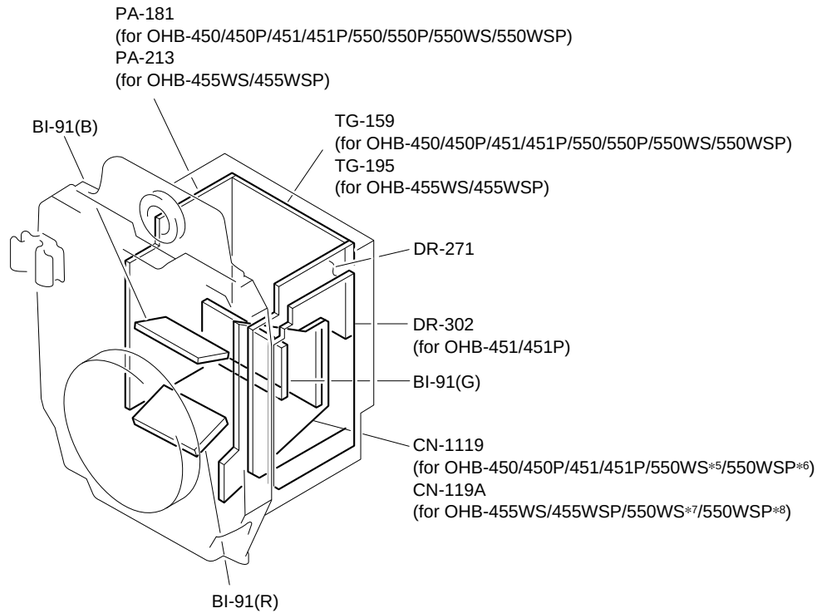
LOCATION OF PRINTED CIRCUIT BOARDS

OHB-400/405WS/500/500WS SERIES



*1: S/N 10001 through 11000 (UC)
S/N 30001 through 31000 (J)
*2: S/N 40001 through 41000 (CE)
*3: S/N 11001 and higher (UC)
S/N 31001 and higher (J)
*4: S/N 41001 and higher (CE)

OHB-450/451/455WS/550/550WS SERIES



*5: S/N 10001 through 11000 (UC)
S/N 30001 through 31000 (J)
*6: S/N 40001 through 41000 (CE)
*7: S/N 11001 and higher (UC)
S/N 31001 and higher (J)
*8: S/N 41001 and higher (CE)

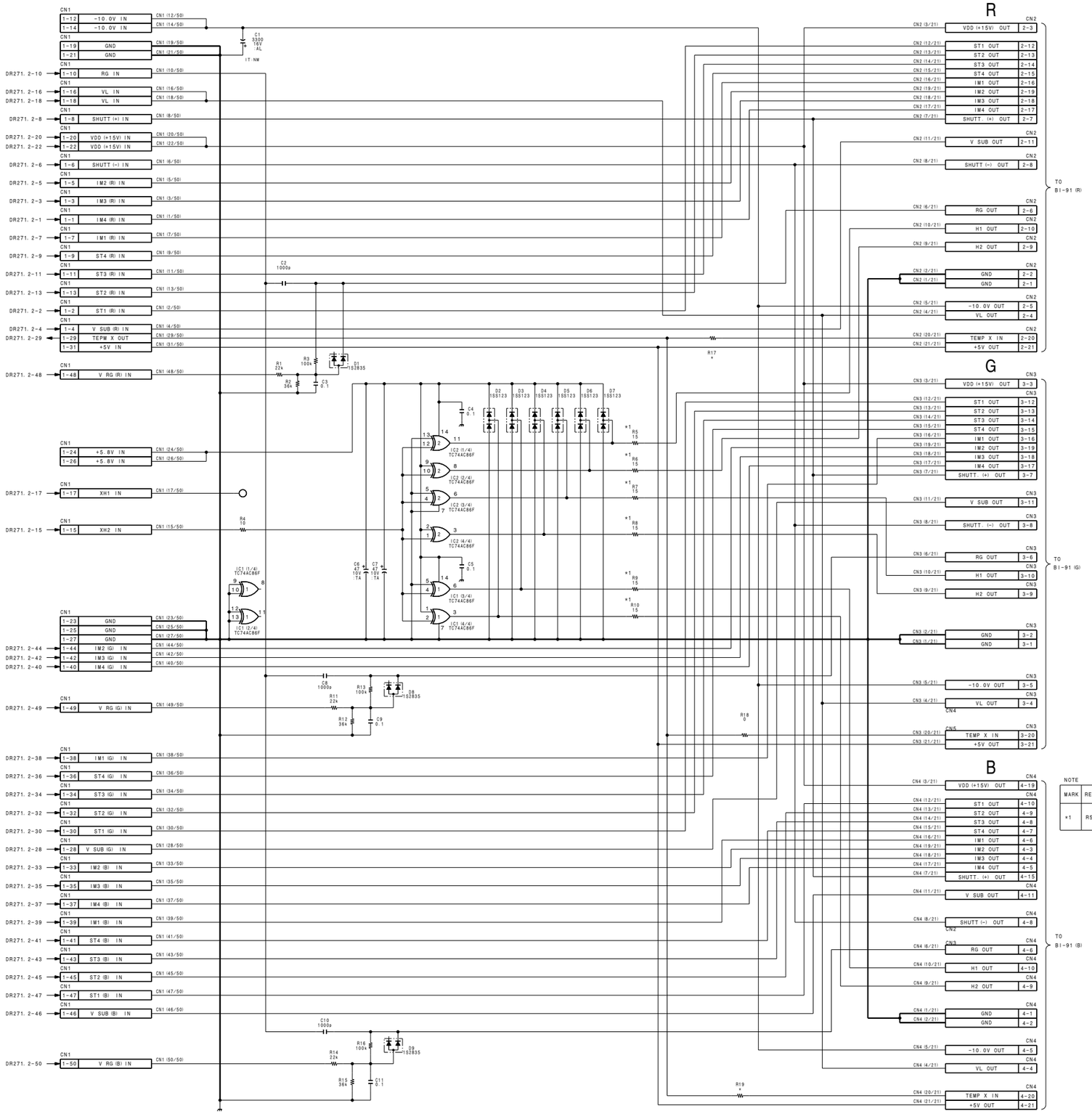
CN-1119 BOARD

- for OHB-400/400P
- for OHB-450/450P/451/451P
- for OHB-500/500P/500WS*1/500WSP*2
- for OHB-550/550P/550WS*1/550WSP*2

CN-1119A BOARD

- for OHB-405WS/405WSP
- for OHB-455WS/455WSP
- for OHB-500WS*3/500WSP*4
- for OHB-550WS*3/550WSP*4

*1 : S/N 10001 through 11000 (UC)
S/N 30001 through 31000 (J)
*2 : S/N 40001 through 41000 (CE)
*3 : S/N 11001 and higher (UC)
S/N 31001 and higher (J)
*4 : S/N 41001 and higher (CE)



MARK	REF. NO.	DESCRIPTION	BOARD
*1	R5-R10	15	CN-1119
		5.6	CN-1119A

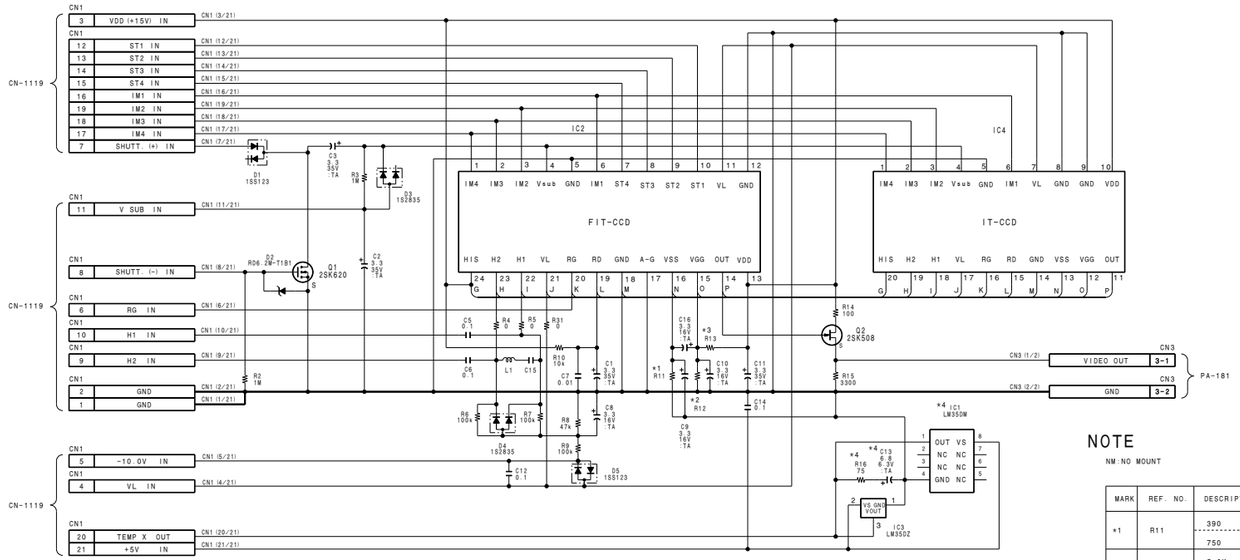
CN-1119/1119A
BOARD NO. 1-657-432-11
LOT NO. 504-
B-¥OHB550-CN1119-11

OHB-400/500/500WS & PAL
OHB-450/451/550/550WS & PAL

BI-91R/91G/91B BOARD (**for OHB-400/400P/500WS*1/500WSP*2**
for OHB-450/450P/451/451P/550WS*1/550WSP*2)

BI-91FR/91FG/91FB BOARD (**for OHB-500/500P/550/550P**
for OHB-500WS*3/500WSP*4/550WS*3/550WSP*4
for OHB-405WS/405WSP/455WS/455WSP)

*1 : S/N 10001 through 11000 (UC)
S/N 30001 through 31000 (J)
*2 : S/N 40001 through 41000 (CE)
*3 : S/N 11001 and higher (UC)
S/N 31001 and higher (J)
*4 : S/N 41001 and higher (CE)



MARK	REF. NO.	DESCRIPTION	BOARD
*1	R11	390	BI-91R/91G/91B
		750	BI-91FR/91FG/91FB
*2	R12	5.6K	BI-91R/91G/91B
		13K	BI-91FR/91FG/91FB
*3	R13	36K	BI-91R/91G/91B
		33K	BI-91FR/91FG/91FB
*4	C13 IC1 R16	NM	BI-91R/91B BI-91FR/91FB

BI-91R/91G/91B
BI-91FR/91FG/91FB

BOARD NO. 1-657-431-12
LOT NO. 504-
B-¥OHB550-BI91G/M

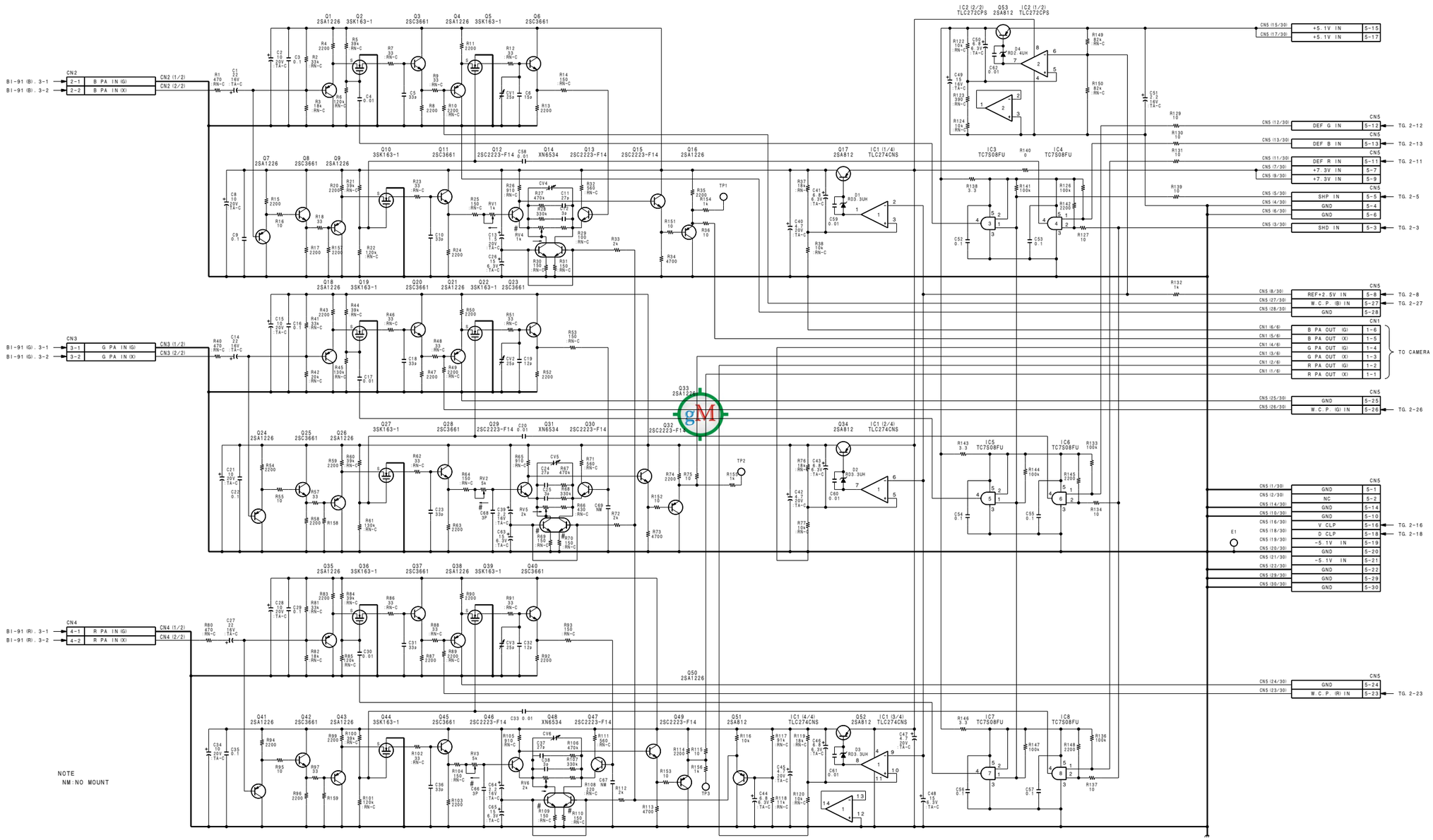
PA-181 BOARD

for OHB-500/500P/500WS/500WSP
for OHB-550/550P/550WS/550WSP
for OHB-400/400P/450/450P/451/451P

PA-181 (1-657-435-11, 13)

*: B SIDE

*	CN1	A-3
	CN2	D-1
	CN3	F-1
	CN4	G-1
	CN5	C-5
*	CV1	B-2
*	CV2	D-4
*	CV3	F-4
	D1	A-4
	D2	A-5
	D3	B-5
	D4	A-2
*	E1	C-5
*	IC1	A-4
	IC2	A-3
	IC3	B-3
	IC4	C-3
	IC5	D-2
	IC6	E-2
	IC7	G-2
	IC8	H-2
*	Q1	C-1
*	Q2	C-2
*	Q3	C-2
*	Q4	C-3
*	Q5	C-3
*	Q6	B-3
*	Q7	C-1
*	Q8	D-1
*	Q9	D-1
*	Q10	C-1
*	Q11	D-2
*	Q12	D-2
*	Q13	C-3
*	Q14	D-4
*	Q15	C-4
*	Q16	B-4
	Q17	A-4
*	Q18	E-1
*	Q19	E-2
*	Q20	E-2
*	Q21	E-3
*	Q22	E-3
*	Q23	E-3
*	Q24	E-1
*	Q25	F-1
*	Q26	F-1
*	Q27	F-1
*	Q28	F-2
*	Q29	F-2
*	Q30	E-3
*	Q31	F-4
*	Q32	E-4
*	Q33	E-4
	Q34	A-5
*	Q35	G-2
*	Q36	G-2
*	Q37	G-2
*	Q38	G-3
*	Q39	G-3
*	Q40	F-4
*	Q41	G-1
*	Q42	H-1
*	Q43	H-1
*	Q44	G-2
*	Q45	H-2
*	Q46	H-3
*	Q47	G-4
*	Q48	H-5
*	Q49	G-4
*	Q50	G-4
*	Q51	F-5
	Q52	B-4
	Q53	A-3
*	RV1	C-2
*	RV2	F-2
*	RV3	H-2
*	RV4	C-3
*	RV5	F-3
*	RV6	H-3
*	TP1	C-5
*	TP2	E-5
*	TP3	E-5



NOTE
NM:NO MOUNT

NOTE
#

REF. NO.	CHANGE INFORMATION	SERIAL NO.
C66. C68	ADD	For the applicable serial No., refer to Section 3-6 Changed parts.
R69. R70	120 → 150	
R109. R110	130 → 150	
RV4	500 → 1k	

PA-181
BOARD NO. 1-657-435-11, 13
LOT NO. 504-
B-¥OHB550-PA181-13

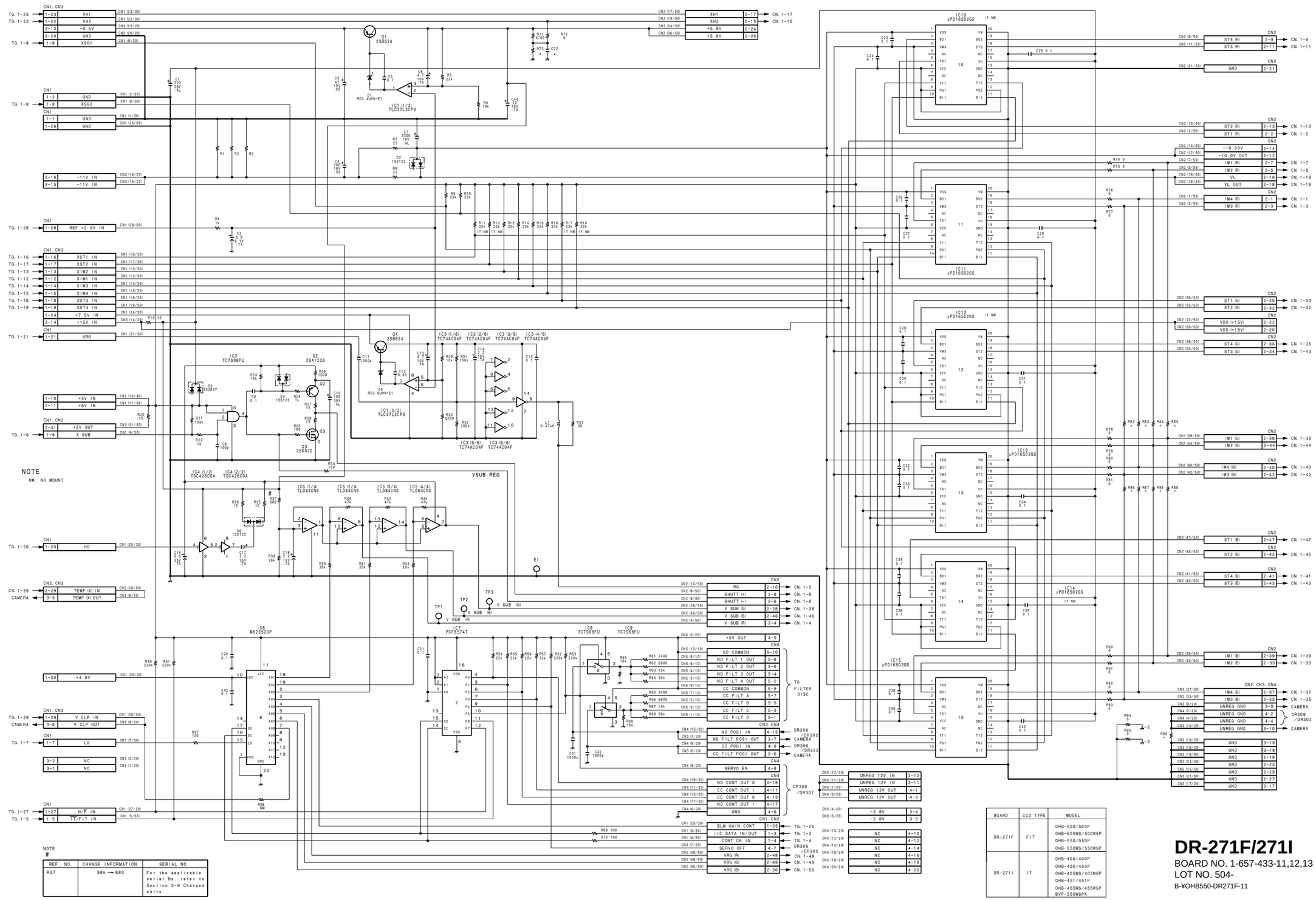
DR-271F BOARD (for OHB-500/500P/500WS/500WSP / for OHB-550/550P/550WS/550WSP)

DR-271I BOARD (for OHB-400/400P/405WS/405WSP / for OHB-450/450P/451/451P/455WS/455WSP)

DR-271 (1-657-433-)

*: B SIDE

	CN1	F-1
	CN2	C-4
*	CN3	B-1
*	CN4	B-3
*	CN5	H-2
	D1	A-3
	D2	H-1
*	D3	F-3
*	D4	F-3
	D5	A-3
	D6	E-2
*	E1	E-5
	IC1	A-3
*	IC2	G-3
*	IC3	D-1
	IC4	D-1
	IC5	C-1
	IC6	A-5
*	IC7	A-5
*	IC8	G-2
*	IC9	G-2
	IC10	C-3
	IC11	D-3
*	IC12	C-3
	IC13	F-4
*	IC14	E-3
	IC15	F-5
*	L1	C-2
	Q1	A-2
*	Q2	F-4
*	Q3	G-4
	Q4	B-3
*	TP1	C-2
*	TP2	D-3
*	TP3	B-2



NOTE
#

REF. NO.	CHANGE INFORMATION	SERIAL NO.
R37	56k → 680	For the applicable serial No., refer to Section 3-6 Changed parts.

BOARD	CCD TYPE	MODEL
DR-271F	FIT	OHB-500/500P OHB-500WS/500WSP OHB-550/550P OHB-550WS/550WSP
DR-271I	IT	OHB-400/400P OHB-450/450P OHB-405WS/405WSP OHB-451/451P OHB-455WS/455WSP BVP-550WSPK

DR-271F/271I

BOARD NO. 1-657-433-11,12,13
LOT NO. 504-

B-¥OHB550-DR271F-11

OHB-400/500/500WS & PAL
OHB-450/451/550/550WS & PAL

DR-302 BOARD (for OHB-400/400P/451/451P)

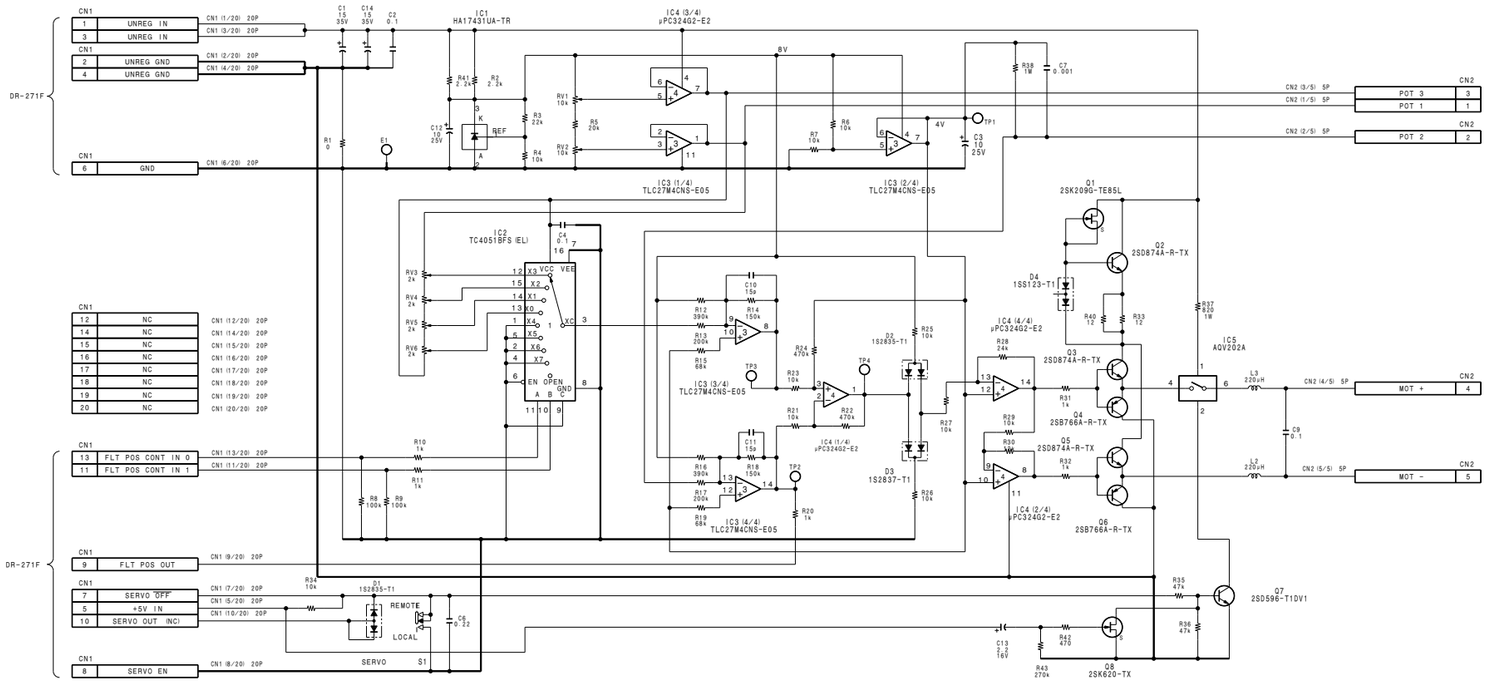
OHB-400 (UC) : S/N 10041 and Higher
OHB-400 (J) : S/N 30007 and Higher
OHB-400P (CE): S/N 40036 and Higher

OHB-451 (UC) : S/N 10046 and Higher
OHB-451 (J) : S/N 30011 and Higher
OHB-451P (CE): S/N 40071 and Higher

DR-302 (1-658-608-12)

*: B SIDE

* CN1	A-3
CN2	F-3
* D1	B-4
* D2	F-2
* D3	F-3
D4	C-4
E1	A-1
* IC1	B-3
* IC2	C-2
* IC3	E-1
* IC4	E-3
IC5	D-2
L2	F-3
L3	E-2
Q1	C-4
Q2	C-3
Q3	D-3
Q4	E-3
Q5	E-4
Q6	F-4
* Q7	F-3
* Q8	E-3
RV1	C-4
RV2	C-2
RV3	B-2
RV4	B-3
RV5	B-3
RV6	B-4
S1	B-1
TP1	C-2
TP2	C-1
TP3	C-4
TP4	C-3



DR-302

BOARD NO. 1-658-608-12
LOT NO. 603-
B-¥OHB400-DR302-12

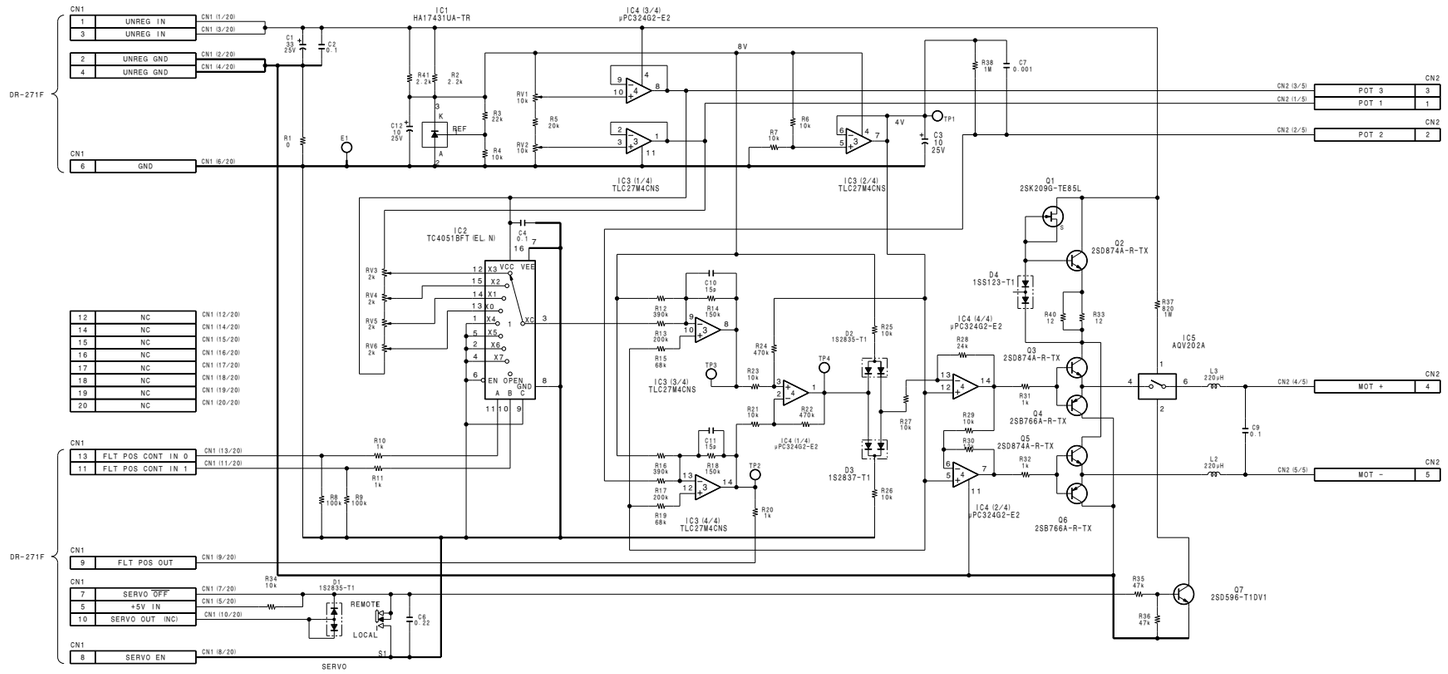
DR-302 BOARD (for OHB-400/400P/451/451P)

OHB-400 (UC) : S/N 10001 - 10040 **OHB-451 (UC) : S/N 10001 - 10045**
OHB-400 (J) : S/N 30001 - 30006 **OHB-451 (J) : S/N 30001 - 30010**
OHB-400P (CE): S/N 40001 - 40035 **OHB-451P (CE): S/N 40001 - 40070**

DR-302 (1-658-608-11)

*: B SIDE

* CN1	A-3
CN2	F-3
* D1	B-4
* D2	F-2
* D3	F-3
D4	C-4
E1	A-1
* IC1	B-3
* IC2	C-2
* IC3	E-1
* IC4	E-3
IC5	D-2
L2	F-3
L3	E-2
Q1	C-4
Q2	C-3
Q3	D-3
Q4	E-3
Q5	E-4
Q6	F-4
* Q7	F-3
RV1	C-4
RV2	C-2
RV3	B-2
RV4	B-3
RV5	B-3
RV6	B-4
S1	B-1
TP1	C-2
TP2	C-1
TP3	C-4
TP4	C-3



DR-302
BOARD NO. 1-658-608-11
LOT NO. 504-
B-¥OHB400-DR302-11

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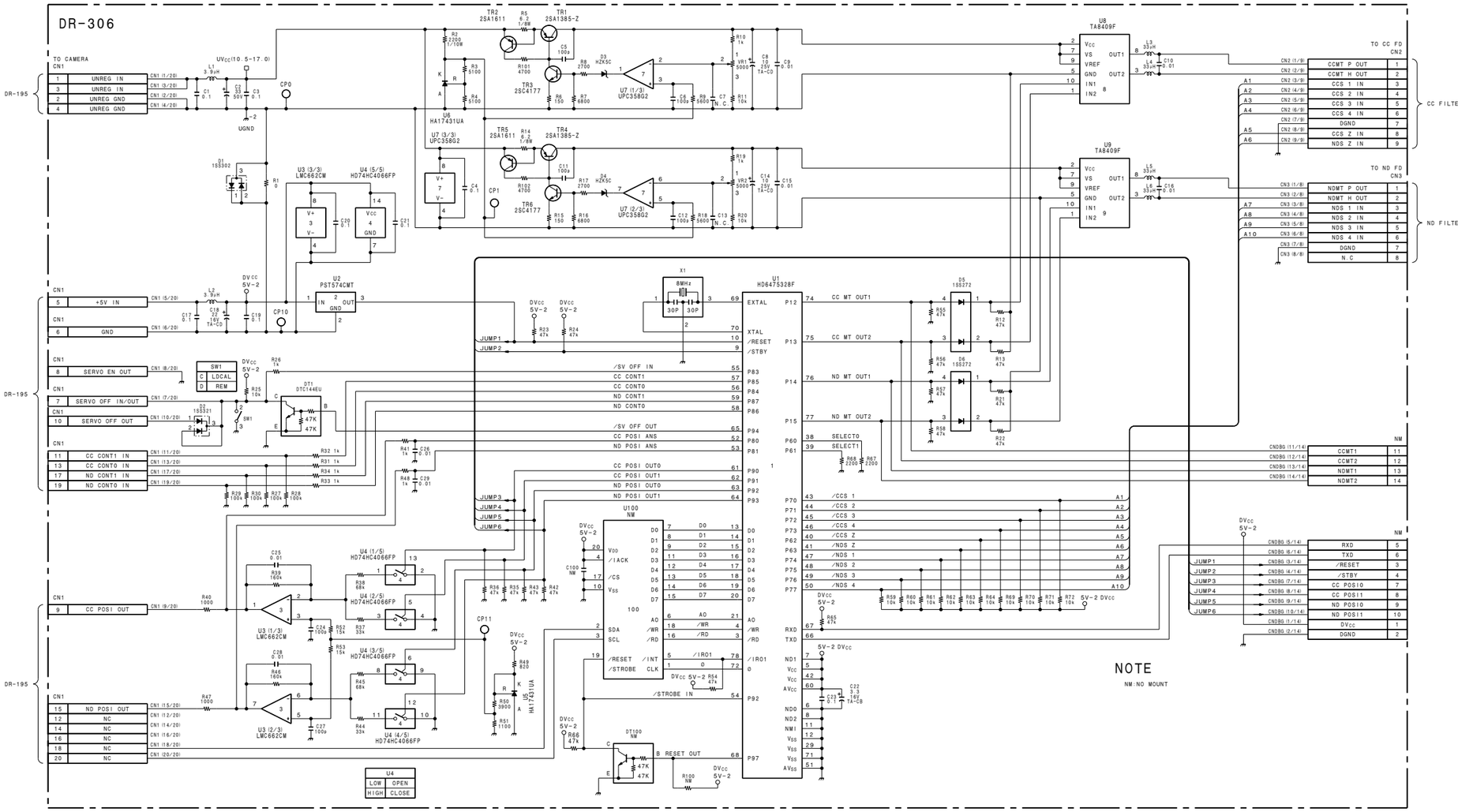
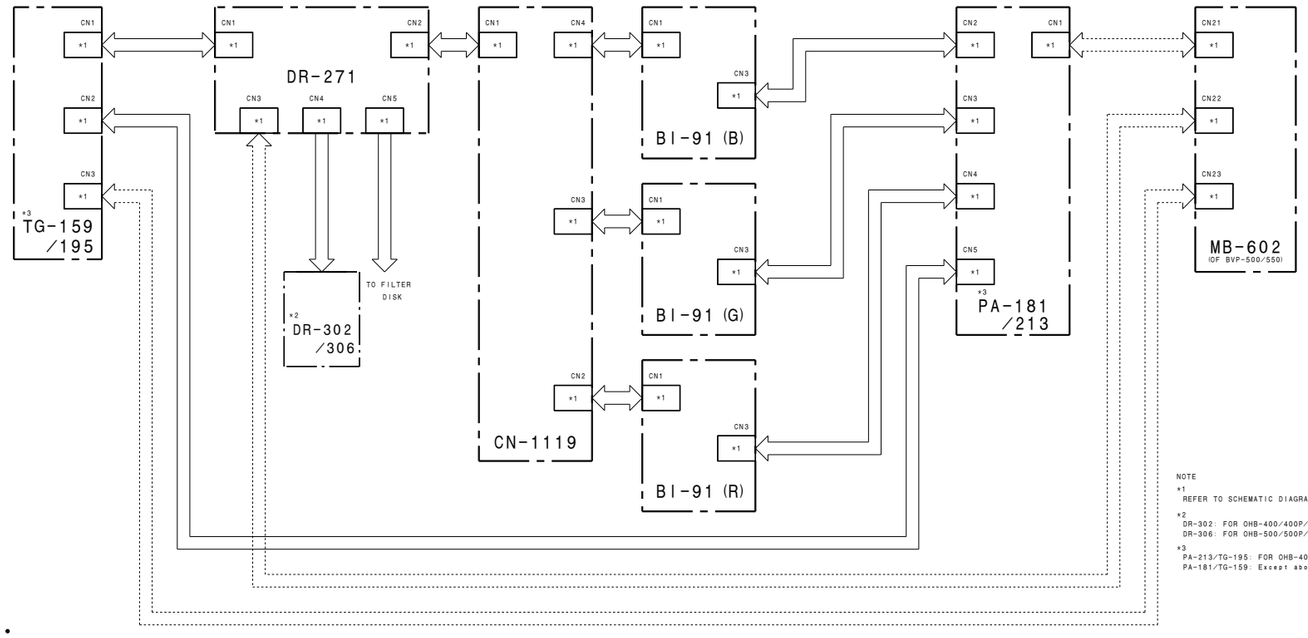
DR-306 BOARD (for OHB-405WS/405WSP/500/500P/500WS/500WSP)



DR-306
LOT NO. 504-
B-¥BKDW701-DR306/M

FRAME WIRING



NOTE
*1
REFER TO SCHEMATIC DIAGRAMS

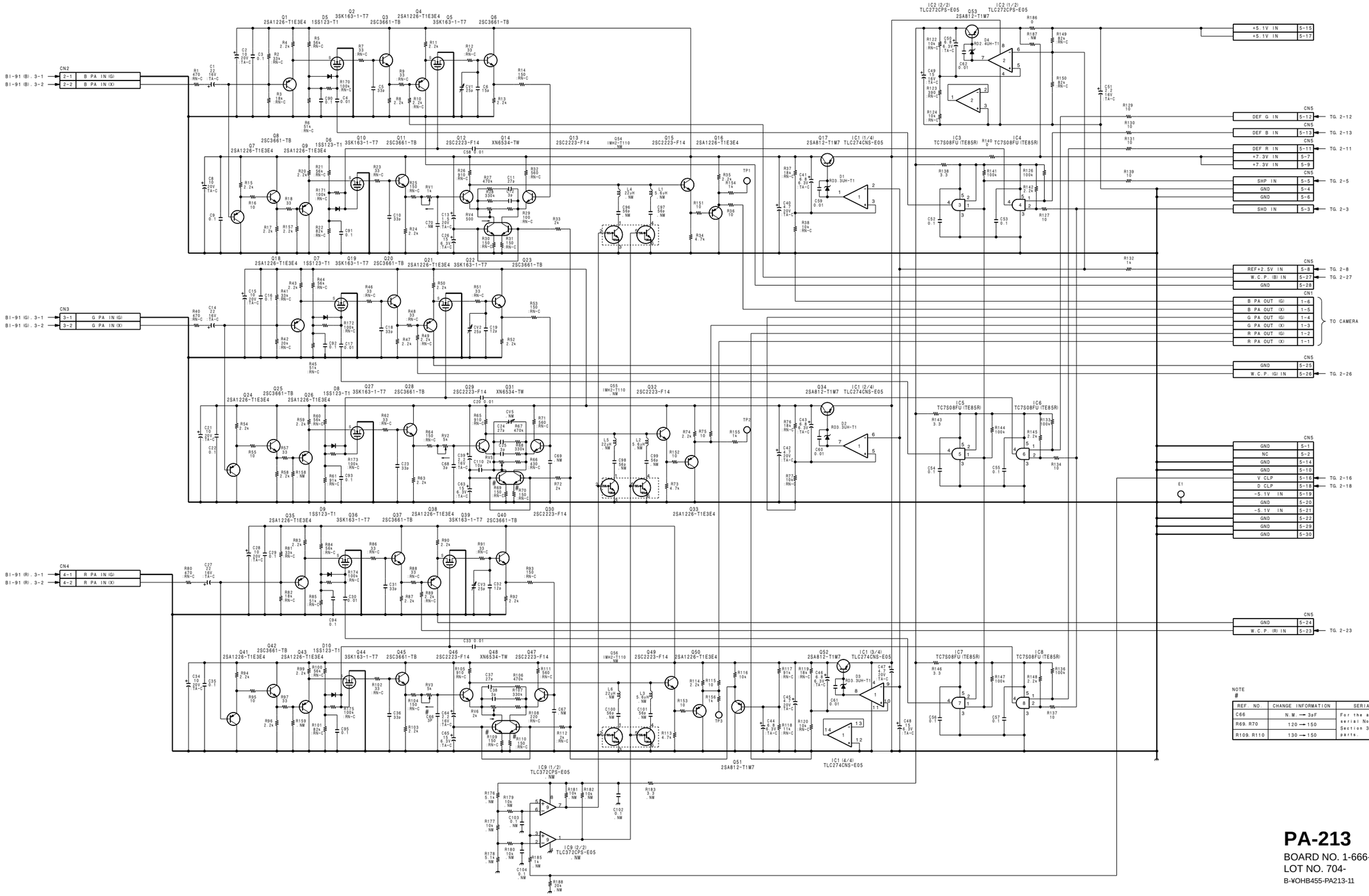
*2
DR-302: FOR OHB-400/400P/451/451P
DR-306: FOR OHB-500/500P/500WS/500WSP

*3
PA-213/TG-195: FOR OHB-405WS/405WSP/455WS/455WSP & BVP-550WSPK
PA-181/TG-159: Except above

FRAME WIRING

B-¥OHB550-FRAME/M

PA-213 BOARD (for OHB-405WS/405WSP/455WS/455WSP)



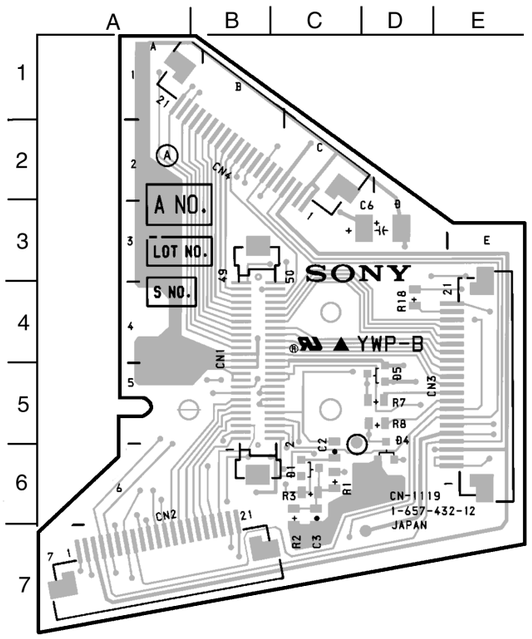
NOTE
#

REF. NO.	CHANGE INFORMATION	SERIAL NO.
C66	N.M. → 3pF	For the applicable serial No., refer to Section 3-6 Changed parts.
R69. R70	120 → 150	
R109. R110	130 → 150	

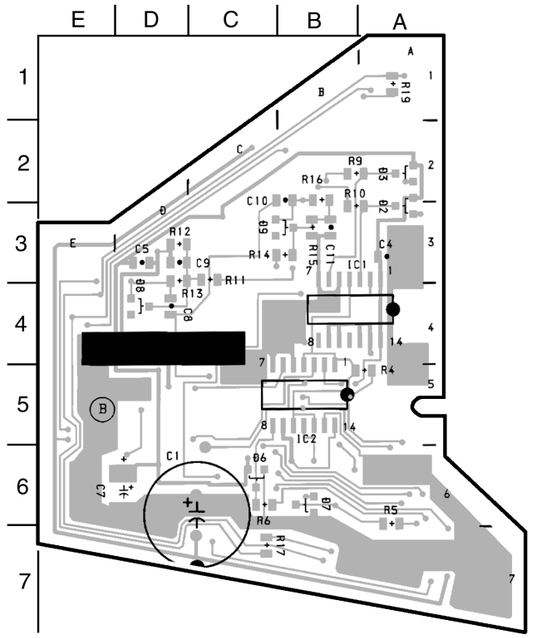
PA-213
BOARD NO. 1-666-696-11
LOT NO. 704-
B-¥OHB455-PA213-11

Section 7
Board Layouts

CN-1119 BOARD

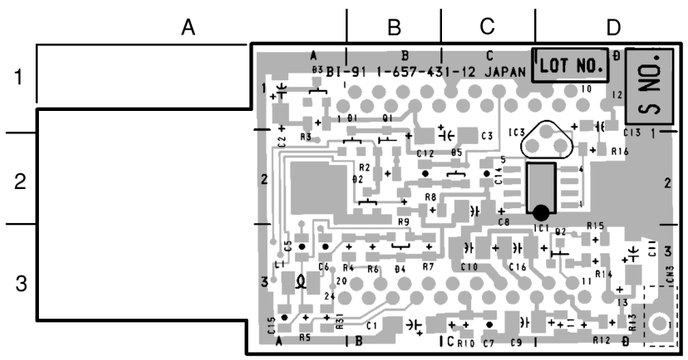


CN-1119 - A SIDE -
1-657-432-11, 12

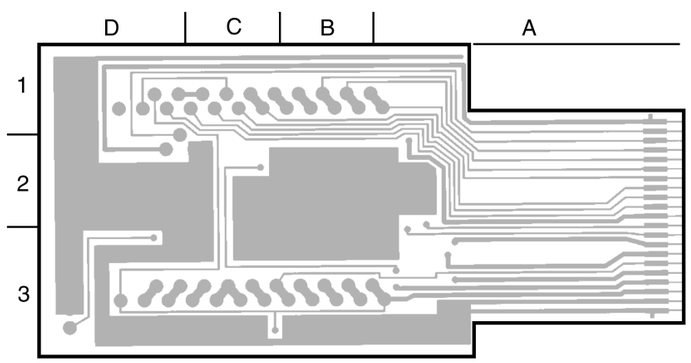


CN-1119 - B SIDE -
1-657-432-11, 12

BI-91 BOARD



BI-91 - COMPONENT SIDE -
1-657-431-12



BI-91 - SOLDERING SIDE -
1-657-431-12

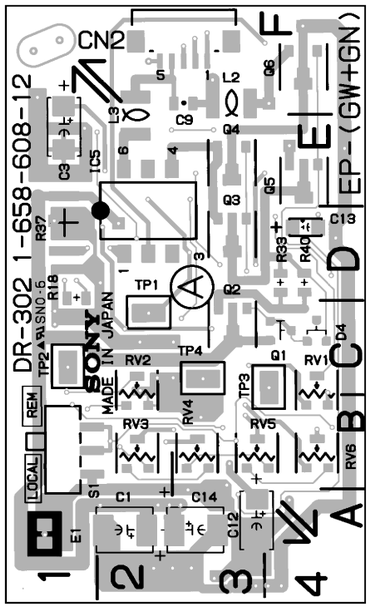
OHB-400 (UC) : S/N 10041 and Higher
OHB-400 (J) : S/N 30007 and Higher
OHB-400P (CE): S/N 40036 and Higher

OHB-451 (UC) : S/N 10046 and Higher
OHB-451 (J) : S/N 30011 and Higher
OHB-451P (CE): S/N 40071 and Higher

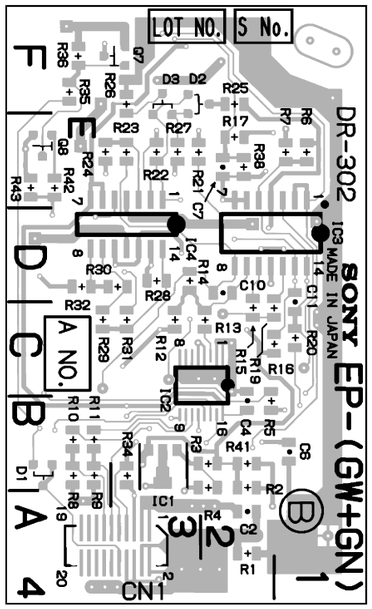
OHB-400 (UC) : S/N 10001 through 10040
OHB-400 (J) : S/N 30001 through 30006
OHB-400P (CE): S/N 40001 through 40035

OHB-451 (UC) : S/N 10001 through 10045
OHB-451 (J) : S/N 30001 through 30010
OHB-451P (CE): S/N 40001 through 40070

DR-302 BOARD

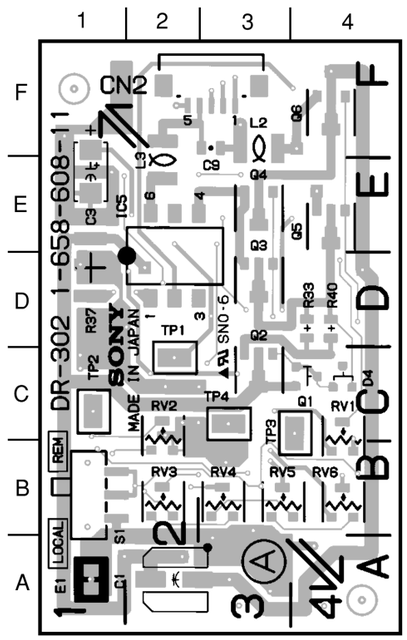


DR-302 - A SIDE -
1-658-608-12

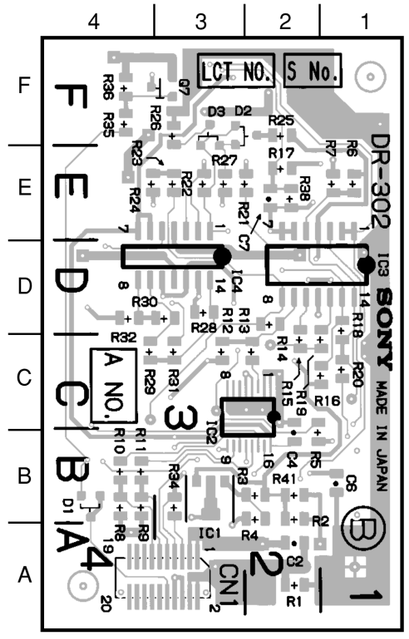


DR-302 - B SIDE -
1-658-608-12

DR-302 BOARD



DR-302 - A SIDE -
1-658-608-11



DR-302 - B SIDE -
1-658-608-11

OHB-400 (UC) : S/N 10031 and Higher
OHB-400 (J) : S/N 30004 and Higher
OHB-400P (CE): S/N 40026 and Higher

OHB-500 (UC) : S/N 10031 and Higher
OHB-500 (J) : S/N 30004 and Higher
OHB-500P (CE): S/N 40004 and Higher

OHB-500WS (UC): S/N 10021 and Higher
OHB-500WS (J) : S/N 30004 and Higher
OHB-500WSP (CE): S/N 40051 and Higher

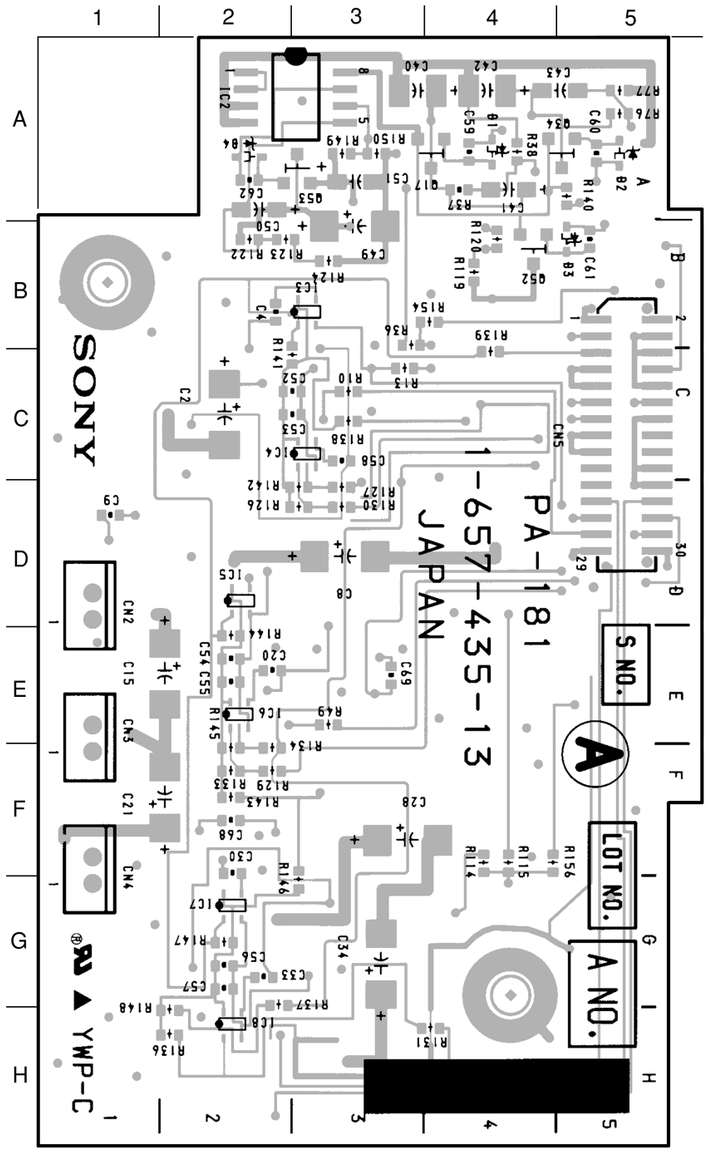
OHB-450 (UC) : S/N 10111 and Higher
OHB-450 (J) : S/N 30011 and Higher
OHB-450P (CE): S/N 40086 and Higher

OHB-451 (UC) : S/N 10026 and Higher
OHB-451 (J) : S/N 30011 and Higher
OHB-451P (CE): S/N 40031 and Higher

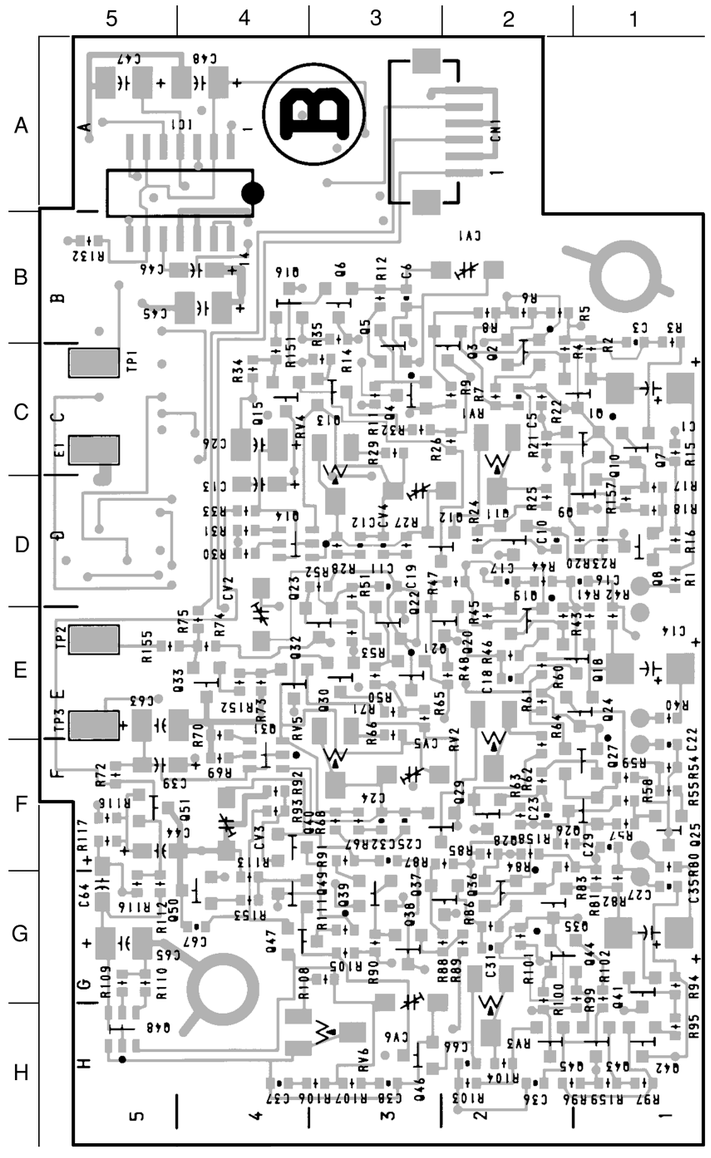
OHB-550 (UC) : S/N 10116 and Higher
OHB-550 (J) : S/N 30026 and Higher
OHB-550P (CE): S/N 40016 and Higher

OHB-550WS (UC): S/N 10036 and Higher
OHB-550WS (J) : S/N 30031 and Higher
OHB-550WSP (CE): S/N 40161 and Higher

PA-181 BOARD



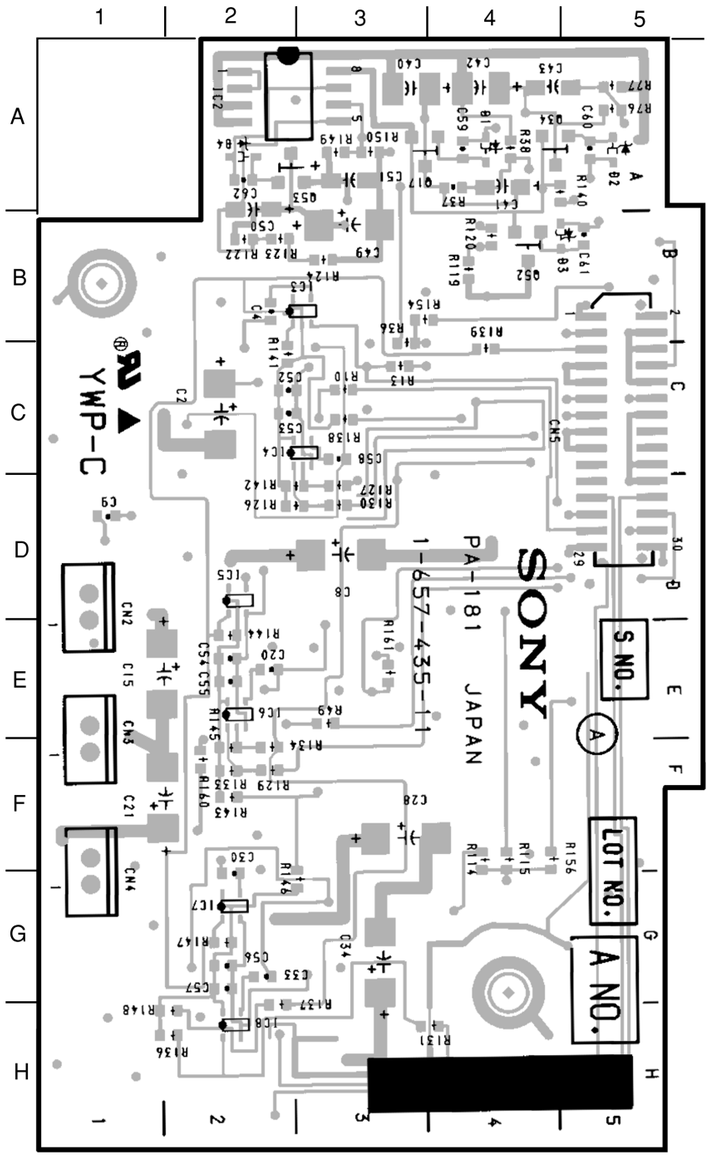
PA-181 - A SIDE -
1-657-435-13



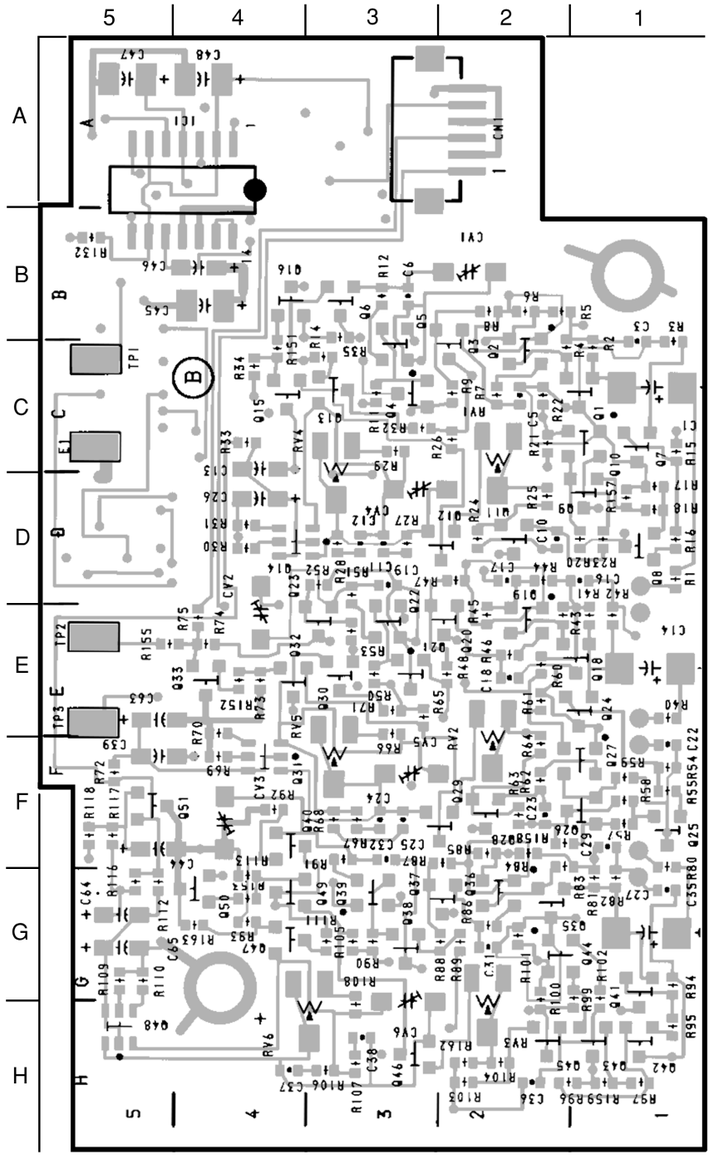
PA-181 - B SIDE -
1-657-435-13

OHB-400 (UC) : S/N 10001 through 10030
OHB-400 (J) : S/N 30001 through 30003
OHB-400P (CE): S/N 40001 through 40025
OHB-500 (UC) : S/N 10001 through 10030
OHB-500 (J) : S/N 30001 through 30003
OHB-500P (CE): S/N 40001 through 40003
OHB-500WS (UC): S/N 10001 through 10020
OHB-500WS (J) : S/N 30001 through 30003
OHB-500WSP (CE): S/N 40001 through 40050
OHB-450 (UC) : S/N 10001 through 10110
OHB-450 (J) : S/N 30001 through 30010
OHB-450P (CE): S/N 40001 through 40085
OHB-451 (UC) : S/N 10001 through 10025
OHB-451 (J) : S/N 30001 through 30010
OHB-451P (CE): S/N 40001 through 40030
OHB-550 (UC) : S/N 10001 through 10115
OHB-550 (J) : S/N 30001 through 30025
OHB-550P (CE): S/N 40001 through 40015
OHB-550WS (UC): S/N 10001 through 10035
OHB-550WS (J) : S/N 30001 through 30030
OHB-550WSP (CE): S/N 40001 through 40160

PA-181 BOARD



PA-181 - A SIDE -
1-657-435-11



PA-181 - B SIDE -
1-657-435-11

OHB-400 (UC) : S/N 10111 and Higher
OHB-400 (J) : S/N 30007 and Higher
OHB-400P (CE): S/N 40046 and Higher

OHB-405WS (UC): S/N 10001 and Higher
OHB-405WS (J) : S/N 30001 and Higher
OHB-405WSP (CE): S/N 40001 and Higher

OHB-500 (UC) : S/N 10101 and Higher
OHB-500 (J) : S/N 30027 and Higher
OHB-500P (CE): S/N 40129 and Higher

OHB-500WS (UC): S/N 10051 and Higher
OHB-500WS (J) : S/N 30019 and Higher
OHB-500WSP (CE): S/N 40141 and Higher

OHB-450 (UC) : S/N 10481 and Higher
OHB-450 (J) : S/N 30066 and Higher
OHB-450P (CE): S/N 40501 and Higher

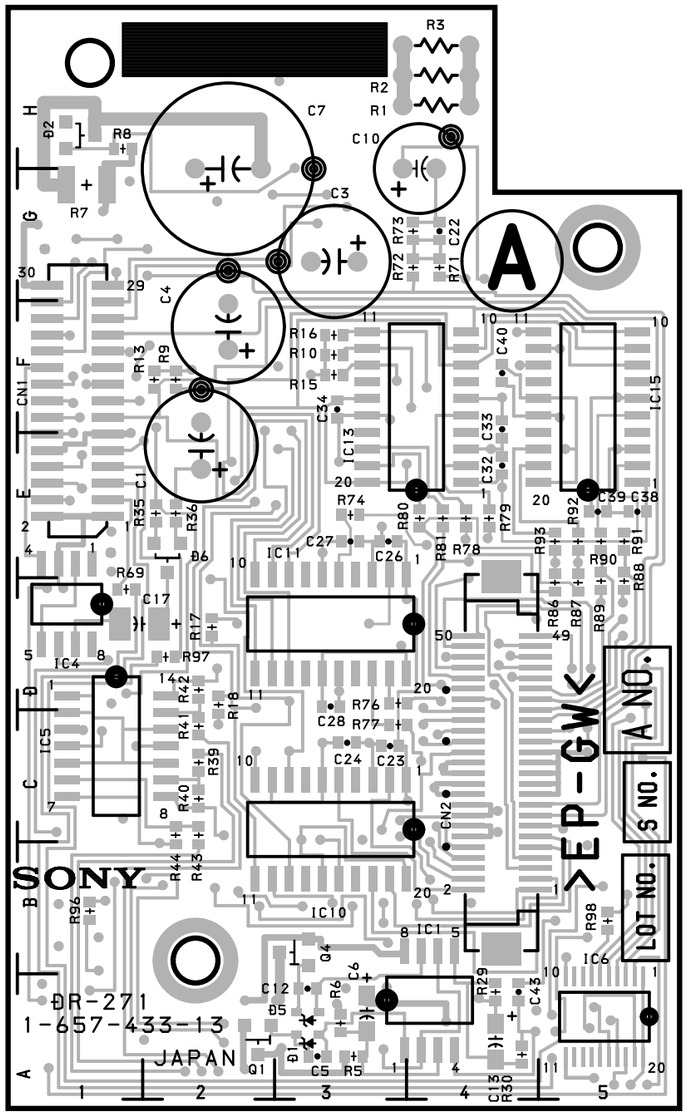
OHB-451 (UC) : S/N 10111 and Higher
OHB-451 (J) : S/N 30041 and Higher
OHB-451P (CE): S/N 40131 and Higher

OHB-455WS (UC): S/N 10001 and Higher
OHB-455WS (J) : S/N 30001 and Higher
OHB-455WSP (CE): S/N 40001 and Higher

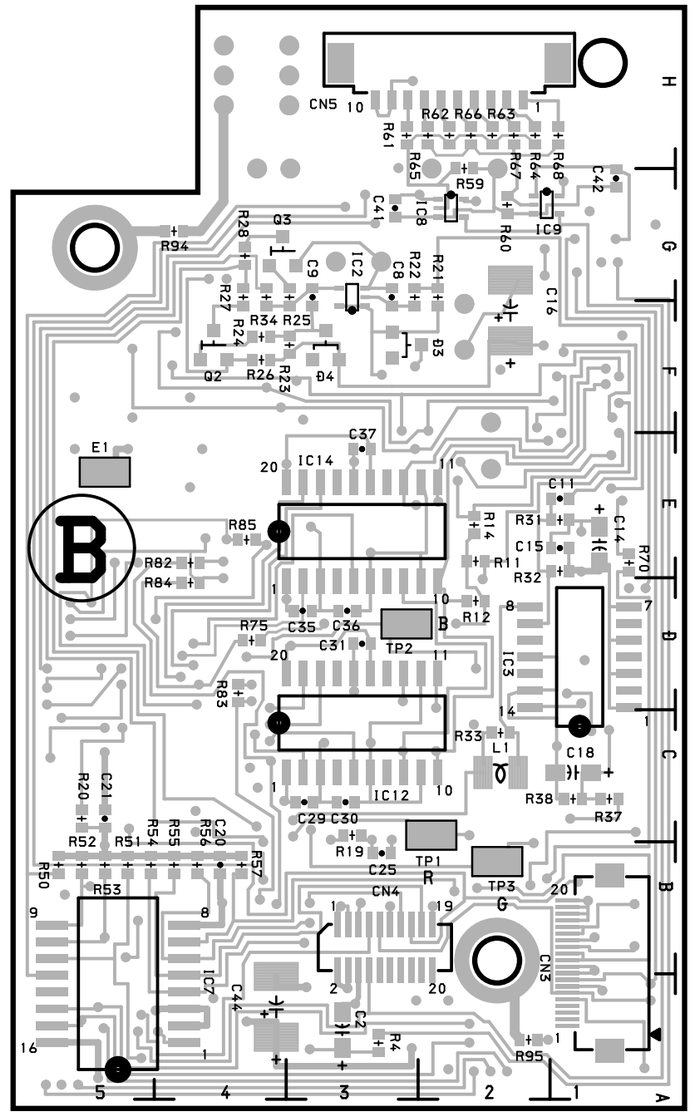
OHB-550 (UC) : S/N 10431 and Higher
OHB-550 (J) : S/N 30166 and Higher
OHB-550P (CE): S/N 40501 and Higher

OHB-550WS (UC): S/N 10106 and Higher
OHB-550WS (J) : S/N 30106 and Higher
OHB-550WSP (CE): S/N 40361 and Higher

DR-271 BOARD



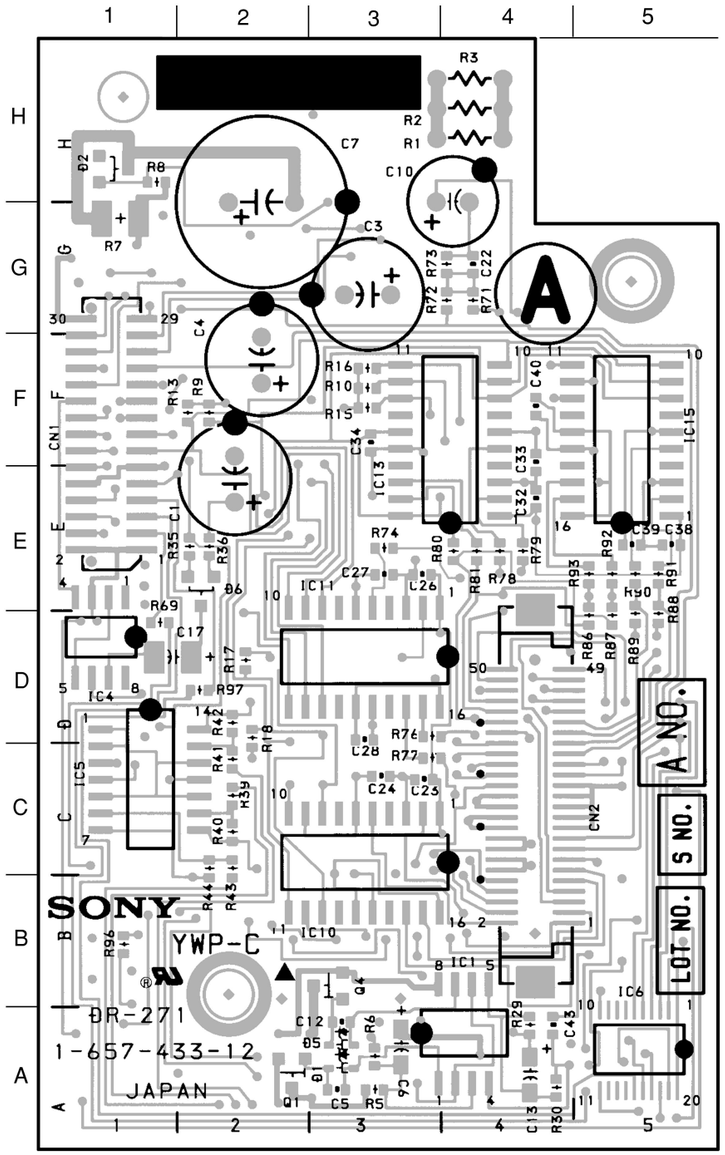
DR-271 - A SIDE -
1-657-433-13



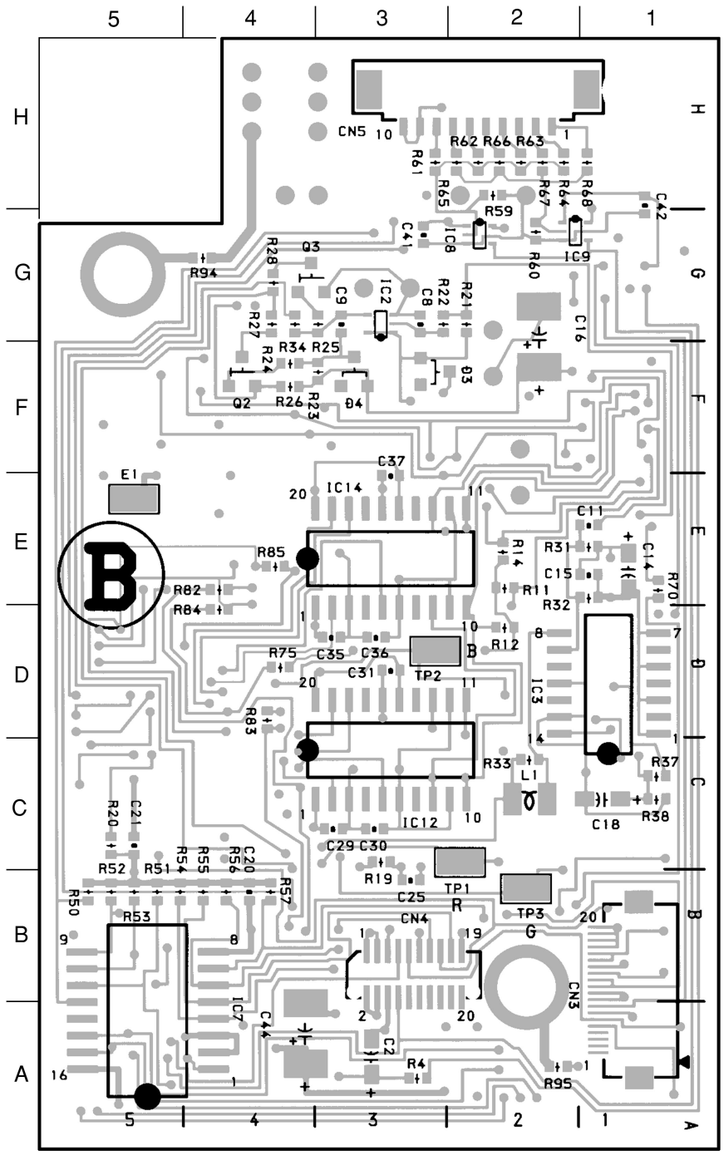
DR-271 - B SIDE -
1-657-433-13

OHB-400 (UC) : S/N 10031 through 10110
OHB-400 (J) : S/N 30004 through 30006
OHB-400P (CE): S/N 40026 through 40045
OHB-500 (UC) : S/N 10031 through 10100
OHB-500 (J) : S/N 30004 through 30026
OHB-500P (CE): S/N 40004 through 40128
OHB-500WS (UC): S/N 10021 through 10050
OHB-500WS (J) : S/N 30004 through 30018
OHB-500WSP (CE): S/N 40051 through 40140
OHB-450 (UC) : S/N 10111 through 10480
OHB-450 (J) : S/N 30011 through 30065
OHB-450P (CE): S/N 40086 through 40500
OHB-451 (UC) : S/N 10026 through 10110
OHB-451 (J) : S/N 30011 through 30040
OHB-451P (CE): S/N 40031 through 40130
OHB-550 (UC) : S/N 10116 through 10430
OHB-550 (J) : S/N 30026 through 30165
OHB-550P (CE): S/N 40016 through 40500
OHB-550WS (UC): S/N 10036 through 10105
OHB-550WS (J) : S/N 30031 through 30105
OHB-550WSP (CE): S/N 40161 through 40360

DR-271 BOARD



DR-271 - A SIDE -
1-657-433-12



DR-271 - B SIDE -
1-657-433-12

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OHB-400 (UC) : S/N 10001 through 10030
OHB-400 (J) : S/N 30001 through 30003
OHB-400P (CE): S/N 40001 through 40025

OHB-500 (UC) : S/N 10001 through 10030
OHB-500 (J) : S/N 30001 through 30003
OHB-500P (CE): S/N 40001 through 40003

OHB-500WS (UC): S/N 10001 through 10020
OHB-500WS (J) : S/N 30001 through 30003
OHB-500WSP (CE): S/N 40001 through 40050

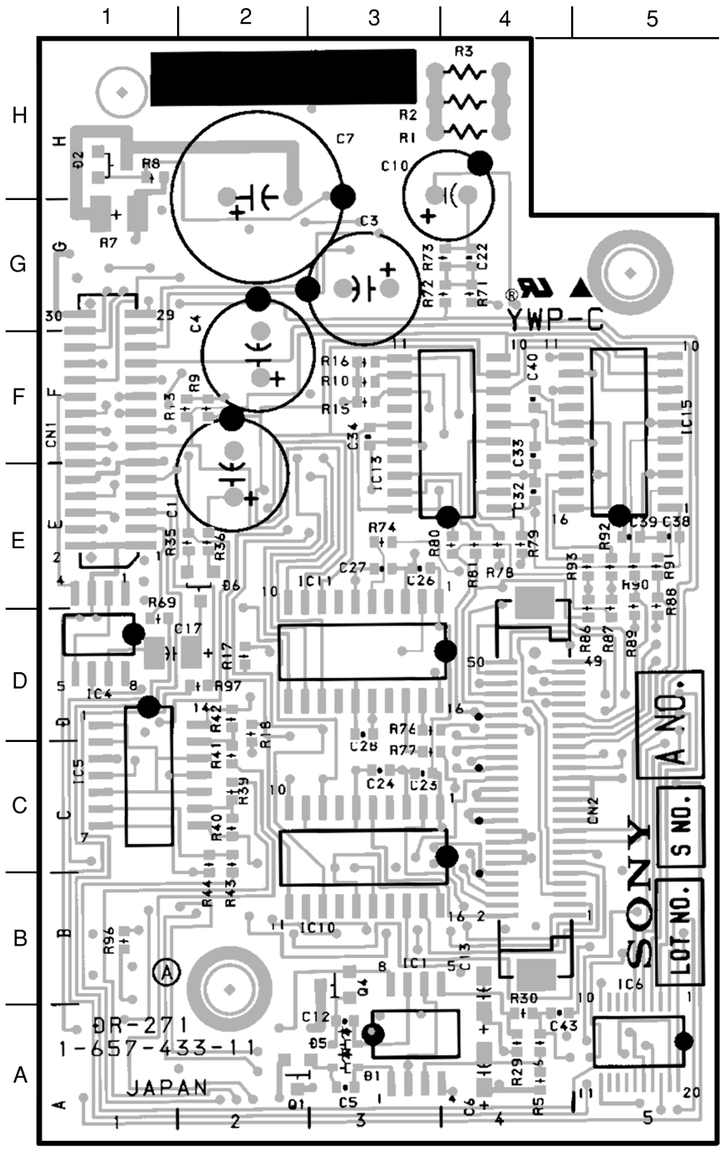
OHB-450 (UC) : S/N 10001 through 10110
OHB-450 (J) : S/N 30001 through 30010
OHB-450P (CE): S/N 40001 through 40085

OHB-451 (UC) : S/N 10001 through 10025
OHB-451 (J) : S/N 30001 through 30010
OHB-451P (CE): S/N 40001 through 40030

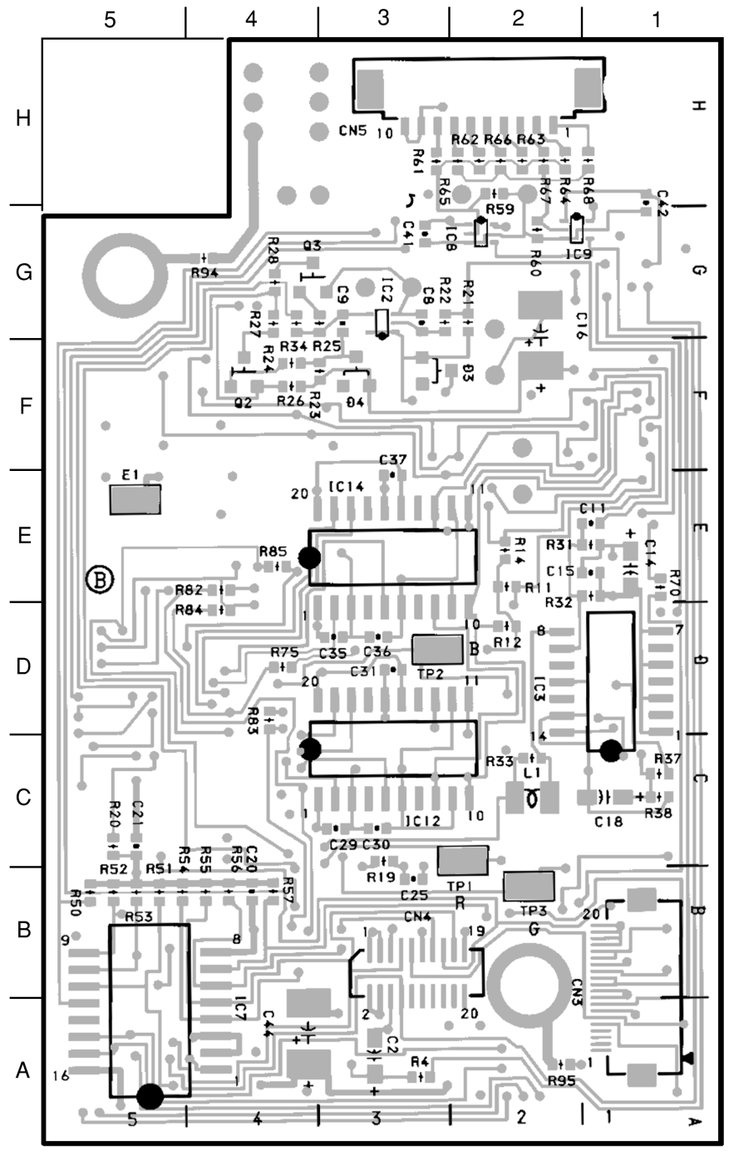
OHB-550 (UC) : S/N 10001 through 10115
OHB-550 (J) : S/N 30001 through 30025
OHB-550P (CE): S/N 40001 through 40015

OHB-550WS (UC): S/N 10001 through 10035
OHB-550WS (J) : S/N 30001 through 30030
OHB-550WSP (CE): S/N 40001 through 40160

DR-271 BOARD



DR-271 - A SIDE -
1-657-433-11

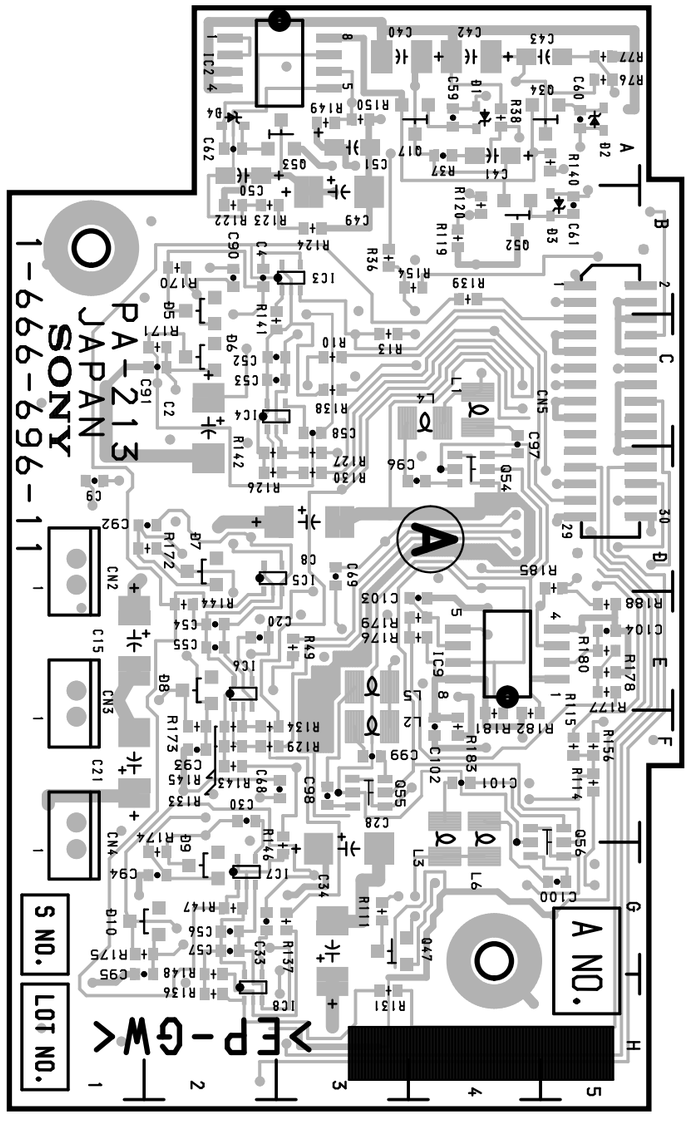


DR-271 - B SIDE -
1-657-433-11

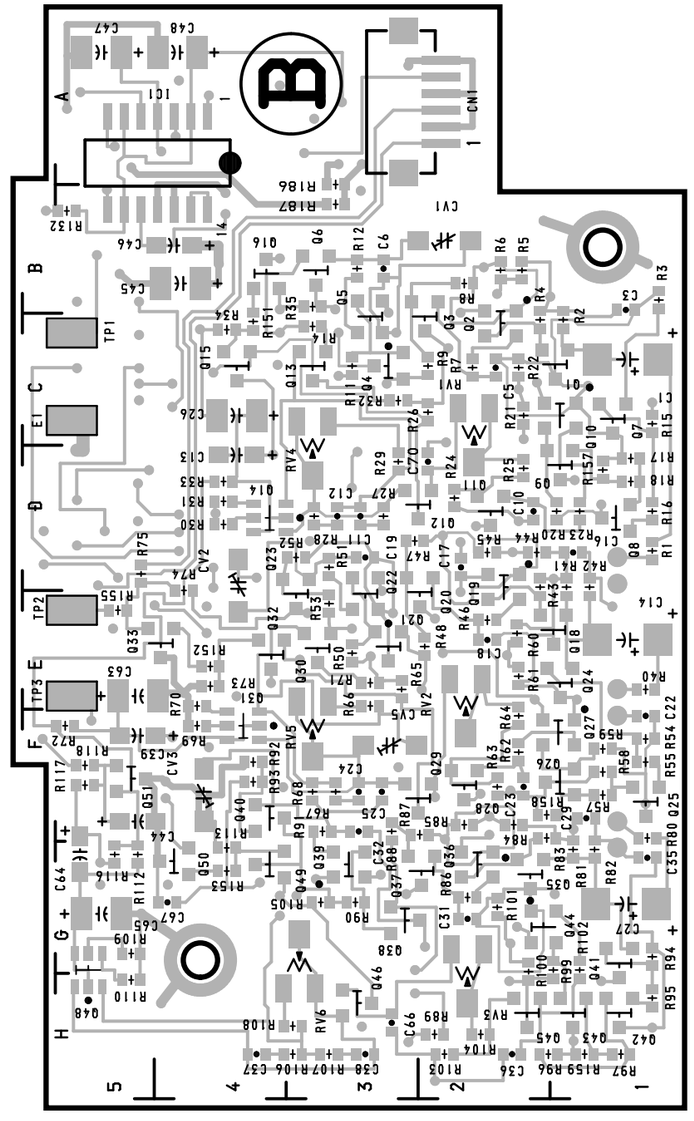
OHB-405WS (UC): S/N 10001 and Higher
OHB-405WS (J) : S/N 30001 and Higher
OHB-405WSP (CE): S/N 40001 and Higher

OHB-455WS (UC): S/N 10001 and Higher
OHB-455WS (J) : S/N 30001 and Higher
OHB-455WSP (CE): S/N 40001 and Higher

PA-213 BOARD



PA-213 - A SIDE -
1-666-696-11



PA-213 - B SIDE -
1-666-696-11

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OHB-400 (J, UC)
OHB-400P (CE)
OHB-450 (J, UC)
OHB-450P (CE)
OHB-451 (J, UC)
OHB-451P (CE)
OHB-500 (J, UC)
OHB-500P (CE)
OHB-550 (J, UC)
OHB-550P (CE)
OHB-405WSP (J, UC)
OHB-405WSP (CE)
OHB-455WS (J, UC)
OHB-455WSP (CE)
OHB-500WS (J, UC)
OHB-500WSP (CE)
OHB-550WS (J, UC)
OHB-550WSP (CE) J, E

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Broadcasting & Professional Systems Company

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